

#1 Atari Computer Magazine

Win An Indus Disk Drive! See Page 6.

U.S.A. \$3.50
CANADA \$4.00

Amiga

The **ATARI**® Resource

JANUARY 1985 VOLUME 3, NUMBER 9

SUPER UTILITIES



**5 SUPER UTILITY
PROGRAMS plus**

**Unlock XL
Parallel Bus!**

New, Easier TYPO II

2 Type-In Games

Color The Cover! See page 6.



**WHEN BATTERIES INCLUDED SET OUT TO
DESIGN THE VERY BEST WORD PROCESSOR
FOR ATARI® COMPUTERS...
THEY FOUND THEY ALREADY HAD IT.**

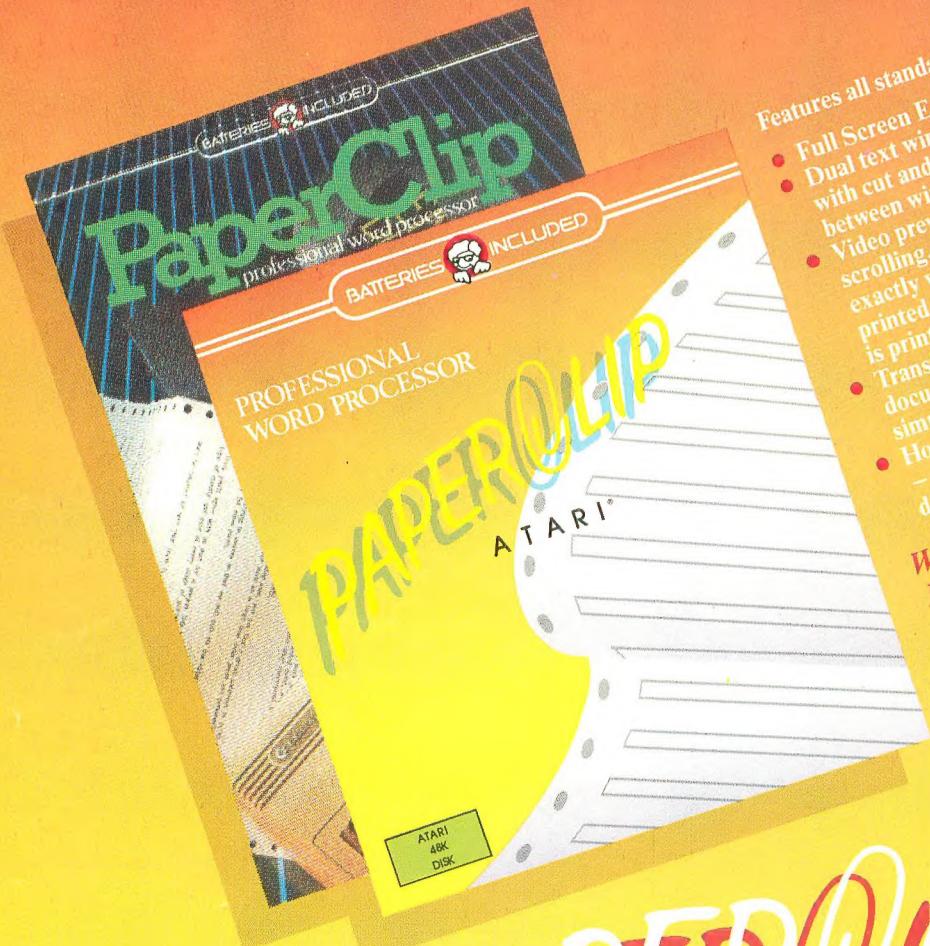
FOR
COMMODORE
AND ATARI

Features all standard word processing functions PLUS

- Full Screen Editing
- Dual text windows with cut and paste between windows.
- Video preview with scrolling, lets you see exactly what will be printed, before it is printed
- Transfer text between documents - easily, simply
- Horizontal scrolling - create wide documents with ease
- Re-arrange words, phrases, sentences, paragraphs, and columns with just a few keystrokes
- More than 40 different printer drivers - plus printer editor allows programming for any conceivable new printer
- Easy to learn, easy to use

**WORKS WITH THE NEW ATARI
B.I. 80 COLUMN DISPLAY
ADAPTOR FOR XL SYSTEMS.**

Compatible with Atari 400, 800,
600 XL, 800 XL, 1200 XL



PAPER CLIP

ATARI®

Few word processors have allowed Atari users to tap the full resources of their computer until Atari Paper Clip...

Atari Paper Clip is an extremely powerful, fully featured word processor that will allow your Atari to operate to the limits of its potential, with an ease of operation and speed you've never thought possible.

**PAPER CLIP FOR ATARI® AND COMMODORE® OWNERS
WHO WANT THE VERY BEST IN WORD PROCESSING.**

BATTERIES



INCLUDED

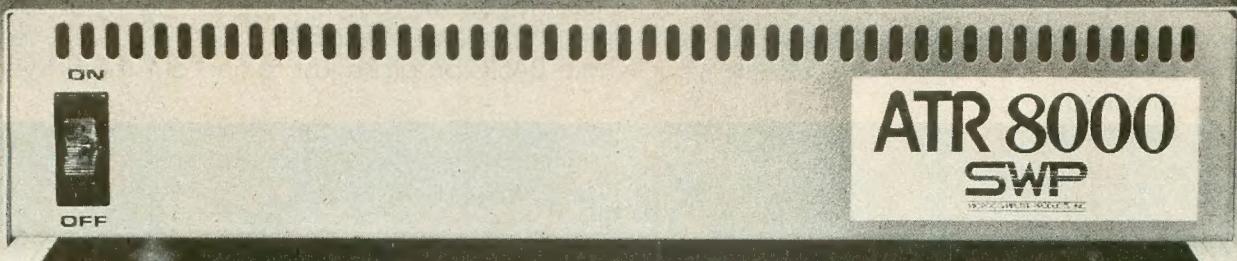
"The Energized Software Company!"

186 Queen St. West
Toronto, Ontario,
M5V 1Z1 Canada
(416) 596-1405

17875 Sky Park North,
Suite P, Irvine, California
USA 92714

FOR A FULL COLOR BROCHURE SEND A STAMPED SELF-ADDRESSED #10 ENVELOPE TO BATTERIES INCLUDED.

CP/M and MS-DOS Compatibility For All Atari Computers



"A fine CP/M machine . . . the ATR8000 closes the gap that has separated Atari owners from the rest of the software market."

—Byte Magazine

CP/M compatibility for your Atari — only from SWP.

Now you can run CP/M programs on your Atari 400, 800, 1200 and XL series computers.

The ATR8000 from SWP Microcomputer Products is a 4MHz, 16k RAM complete Atari interface. When you add the optional 64k RAM, the ATR8000 will run CP/M!

The ATR8000 features:

- 64k RAM
- RS-232 port with software to run a serial printer or modem.
- The ability to run up to four 5 1/4" or 8" drives of any mixture, type and density (MY-DOS is optional and is used for double density Atari operations).
- Double density CP/M 2.2.
- 80 column wide display with 40 column moveable window. Or an optional 80 column software (AUTOTERM-80) program that can be used with a black & white TV or monitor.

When you order your ATR8000, you'll not only receive the hardware and software you need, but also an easy to read owner's manual and CP/M supplement that will take you into the exciting world of CP/M.

Add MS-DOS compatibility too!

An Atari that runs MS-DOS, IBM-PC software?

By adding CO-POWER-88, our own 8088 co-processor to your ATR8000, you can also run most of the popular MS-DOS, IBM-PC software.

The CO-POWER-88 is a 16 bit, 5.33 MHz, 8088 co-processor with 128k or 256k RAM. It comes complete with MS-DOS and RAM disk software. CP/M-86 is available as an option.

More than just a co-processor, its RAM can also be used as a high speed simulated disk drive for CP/M.

Installation is simple. Your CO-POWER-88 comes with the Z-80 adaptor board and main processor board. You'll also receive a complete owner's manual and easy-to-follow instructions.

CP/M and MS-DOS, IBM-PC compatibility for your Atari can now be yours.

Contact your local SWP dealer or order direct by mail. Better yet, for fastest delivery, use your credit card and shop by phone.

Credit Card Orders Save Time!

Call 817-469-1181 or 817-861-0421 And Order Now

Or Mail Coupon to: SWP, 2500 E. Randol Mill Rd., Suite 125, Arlington, TX 76011

Please ship the following:

16k ATR8000 Atari Interface@\$450.00 + \$10.00 shipping.
 64k ATR8000 w/CP/M@\$599.95 + \$10.00 shipping.
 128k CO-POWER-88 with MS-DOS@\$400.00 + \$10.00 shipping.*
 256k CO-POWER-88 WITH MS-DOS@\$500.00 + shipping.*
 CP/M 86 (16-bit Disk Operating System)@\$70.00 + \$5.00 shipping.
 MY-DOS (Atari-like Disk Operating System)@\$29.95 + \$2.00 shipping.
 AUTOTERM-80 (80 column display for CP/M or MS-DOS)@\$29.95 + \$2.00 shipping.
* Must be used with 64k ATR8000.

Specify Atari model computer you own: _____

Configurations: (check one) 5 1/4" drive _____ or 8" drive _____

I want to learn more about the ATR8000 and CO-POWER-88. Enclosed is \$1.00 (cash only) for more literature, including a comprehensive listing of MS-DOS and CP/M-86 software that runs on the CO-POWER-88.

Method of payment:

Personal Check enclosed (must clear bank before shipping)
 Certified Check or Money Order enclosed.
 Charge the following credit card:

Master Card Visa

Credit Card # _____ Exp. Date _____

Subtotal: _____ + Shipping _____ + Sales Tax (Texas Residents add 5%) _____ =

Total Enclosed: _____

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone (h) (____) - (w) (____) - (____)

Signature: _____

© 1984, SWP Microcomputer Products, Inc. Trademarks: CO-POWER-88 and ATR8000, SWP Microcomputer Products, Inc., IBM-PC, International Business Machines; Z80, Zilog; MS-DOS, Microsoft, Inc.; CP/M and CP/M-86, Digital Research, Inc.; Atari, Atari, Inc.

SWP

MICROCOMPUTER PRODUCTS, INC.

2500 E. Randol Mill Rd., Suite 125, Arlington, TX 76011

THE MMG BASIC COMPILER

ATARI OWNERS FINALLY!

The BASIC Compiler for Every Need and Every Program!

Tired of using those other BASIC compilers that don't do the job for you? Is there a long list of valid BASIC commands that they don't support? Or don't they compile to true 6502 machine language for maximum speed? Or do you have to rewrite your whole BASIC program just to find out that it won't run when compiled?

Announcing THE MMG BASIC COMPILER

THE FIRST COMPLETE BASIC COMPILER FOR THE ATARI COMPUTERS THAT PRODUCES NATIVE 6502 CODE

What is a BASIC compiler?

BASIC, as we all know, is an easy-to-use language for ATARI computers. Its only disadvantage is that it's SLOW. For some types of functions, it seems to take BASIC programs forever to execute. We all know that the fastest language available is machine language, the language of ones and zeros. But don't worry! Now you don't have to learn a whole new language just to have programs execute with machine language speed. The MMG BASIC COMPILER takes your BASIC program and converts it to machine language for you. Furthermore, this machine language program will autorun, simply by naming it AUTORUN.SYS, putting it on a disk with the DOS 2.05 files on it, and turning on your computer with that disk in your drive.

What will a compiler do for me?

Using the MMG BASIC COMPILER, you can program in BASIC, the same BASIC you already know, and get your program up and running. Then the MMG BASIC COMPILER will convert your BASIC program for you, producing lightning-fast programs to rival those of the professionals. Imagine moving a player from the top of the screen to the bottom in less than a second! Try that using other compilers! Imagine what your programs will be like when they're compiled to true 6502 machine language. The MMG BASIC COMPILER has been used to produce commercially available arcade-type games from BASIC source code, and can do the same for you! MMG would even be interested in marketing your results! If you produce what you believe to be a marketable program, call us for details!

Can your compiler:

- compile to fast 6502 machine language, not slow pseudocode (P-code)?
- support trigonometric functions like ATN, COS, SIN?
- support mathematical functions like CLOG, EXP, LOG, RND, SQR?
- support RUN "D:PROGRAM"?
- support ATARI string handling like A\$(2,4) = "BOD"?
- support COMmon variables?
- support the POP command?
- support the LPRINT command?
- support either RAD or DEG calculations?
- support both integer and floating point arithmetic?
- operate in either single or true double density?
- allow DATA statements anywhere in your program?
- produce assembly language source code of your program for your own use?

The MMG BASIC COMPILER does!

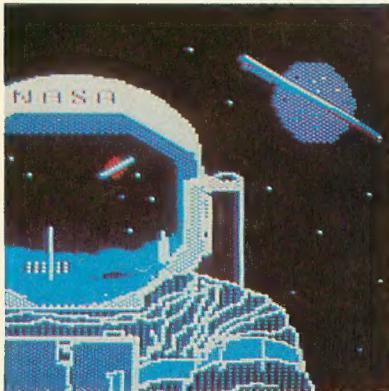
The MMG BASIC COMPILER comes with both single and double density versions on the same disk, and is available from your local computer store, or send \$99.95 plus \$3.00 for shipping and handling to:

MMG Micro Software P.O. Box 131 Marlboro, NJ 07746 (201) 431-3472

Visa, MasterCard, or COD orders accepted. New Jersey residents please add 6% sales tax.

Antic®

The ATARI® Resource JANUARY 1985, VOLUME 3, NUMBER 9



Microscreens look to the future 8

FEATURES

INTRODUCING TYPO II by Jack Powell	19
Easier proofreading for Antic type-ins	TYPE-IN SOFTWARE
WIDGETEXT by Bill Morris	34
Bold letters beef up Graphics 0	TYPE-IN SOFTWARE
TOUCH TABLET CURSOR by Karl Wiegers	36
Koala is mightier than a mouse!	TYPE-IN SOFTWARE
DISKIO by Bernard Oppenheim, M.D.	40
Supercharger for Atari DOS	TYPE-IN SOFTWARE
PARALLEL BUS REVEALED by Earl Rice	44
Transfer 100,000 bytes per second	
ESCAPE FROM DOS 3 by Charles Jackson	48
Back to good old DOS 2.05	
ANTIC BOOKSHELF by the Antic Staff	65
Bonanza of new books for Atari owners	
NEW ATARI FLIGHTS by Charles Jackson	76
Flight Simulator II, Space Shuttle, F-15 Strike Eagle	



Rapid transit with the parallel bus 44

DEPARTMENTS

COMMUNICATIONS	
STARTING A BULLETIN BOARD, PART II by Suzi Subeck	12
TOOLBOX	TYPE-IN SOFTWARE
BASIC SEARCHER by Scott Scheck	17
PROFILE: DAN BUNTER	
"SEVEN CITIES OF GOLD" DESIGNER by Arthur Leyenburger	20
GAME OF THE MONTH	TYPE-IN SOFTWARE
Q.T. by Brian McWilliams	30
BONUS GAME	TYPE-IN SOFTWARE
SCRAMBLE by F. Neil Simms	33
ASSEMBLY LANGUAGE	
OP-CODE FINDER by Donny Cherf	69



Wildlife conservation, Antic style! 30

SOFTWARE LIBRARY

TYPE-IN LISTINGS SECTION	51
<hr/>	
EDITORIAL	6
MICROSCREENS	8
I/O BOARD	10
HELP!	11
ANTIC'S SOFTWARE STORE	72
<hr/>	
ATARI SERVICE CENTERS	74
PRODUCT REVIEWS	79
SHOPPER'S GUIDE	86
ADVERTISER'S LIST	89

Antic

The ATARI® Resource

Publisher
James Capparell

Editorial Department
Nat Friedland, Editor
Jack Powell, Technical Editor
Michael Ciraolo, Staff Writer
Charles Jackson, Staff Writer
Melissa Rockliff, Editorial Coordinator

Contributing Editors
Carl Evans, Ken Harms
Jerry White, Suzi Sobeck
Anita Malnig

Art Department
Marni Tapscott, Art Director
Kyle Bogertman, Production Supervisor
Linda Tapscott, Ad Production Coordinator
Patricia Fostar, Production Assistant

Cover Artist
Pete McDonnell

Circulation Department
Les Tork, Manager
Peter Walsh, Shipping
Hun-sik Kim, Shipping
Monica Burrell, Subscriptions
Eve Gowdy, Dealer Sales
Doug Millison, Retailer Sales

Accounting Department
V.J. Briggs, Manager
Brenda Oliver, Accounts Receivable
Lorene Kaatz, Credit Manager

Marketing
Gary Yost, Manager, Marketing Support
Steve Randall, Advertising Sales Director

Maria E. Chavez, Receptionist

General Offices (415) 957-0886
Advertising Sales (415) 661-3400
Credit Card Subscriptions
outside California (800) 227-1617 ext. 133
inside California (800) 772-3545 ext. 133
Subscription Problems (415) 397-1881

January 1985
Volume 3, Number 9

ANTIC—The ATARI Resource is published twelve times per year by Antic Publishing. Editorial offices are located at 524 Second Street, San Francisco, CA 94107. ISSN 0745-2527. Second Class Postage paid at San Francisco, California and additional mailing offices. POSTMASTER: Send address change to **Antic**, 524 Second Street, San Francisco, CA 94107.

Editorial submissions should include program listing on disk or cassette, and text file on media and paper if text was prepared with a word processor. Media will be returned if self-addressed stamped mailer is supplied. **Antic** assumes no responsibility for unsolicited editorial material.

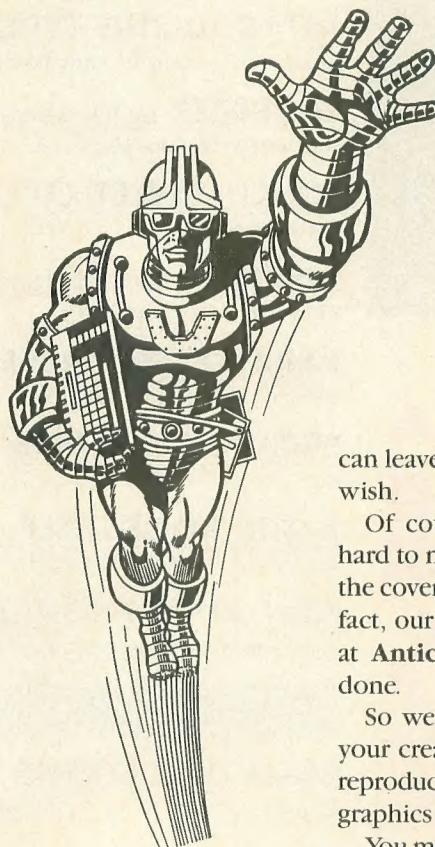
Antic is an independent periodical not affiliated in any way with Atari Corp. ATARI is a trademark of Atari Corp. All references to Atari products are trademarked and should be so noted.

Antic is a registered trademark of Antic Publishing, Inc.

Copyright ©1985 by **Antic** Publishing.
All Rights Reserved. Printed in USA.

COLOR THE COVER

Win a \$499. Disk Drive



can leave out all the cover text if you wish.

Of course, we recognize that it's hard to match the detailed quality of the cover's line art with your Atari. In fact, our publisher was the only one at **Antic** who thought it could be done.

So we are challenging you to use your creativity and come as close to reproducing the artwork as computer graphics technology allows.

You may work alone or collaborate with friends and family. Enter as many colorings as you want. But all entries must be received at **Antic** by February 1, 1985.

Be sure to send loading instructions along with your disk or cassette—plus a short note telling about yourself and your computer graphics tools.

The winning and runner-up micro-screens will appear in the June, 1985 **Antic**. First prize is an Indus GT disk drive. Second and third prize are Antic T-shirts. All entries become the property of Antic Publishing, Inc. and will not be returned. Contest is void where prohibited.

As you probably noticed, this month's cover is missing something . . . color. We decided to leave the coloring to you, for once.

This is your invitation to enter **Antic's Color The Cover Contest** and possibly win an Indus GT disk drive list-priced at \$499.99. Send in a disk or cassette of your color rendition of the January **Antic** cover.

We're keeping the rules simple: You must use your Atari to reproduce the form and spirit of the cover drawing. Any Atari-compatible graphics hardware and software is eligible. You can reposition Super Utility Man to fit better across your video screen. And you

Mail your entries to:

Color The Cover

Antic Magazine

524 Second St.

San Francisco, CA 94107.

Apple IIe/IIc • Atari
Commodore 64
IBM PCjr

Imagine...

- *A Program that gives your computer the power of full word processing, but as easy to use as a typewriter.
- *A Program that stores and retrieves any type of information and that understands real English commands.
- *A Program that enables your computer to talk over a telephone to other computers around the world.

HomePak™

by Russ Wetmore.

Featuring three of the most needed personal productivity tools;
All for the incredible price of **\$49.95***

Imagine...

Word Processing with **HomeText**

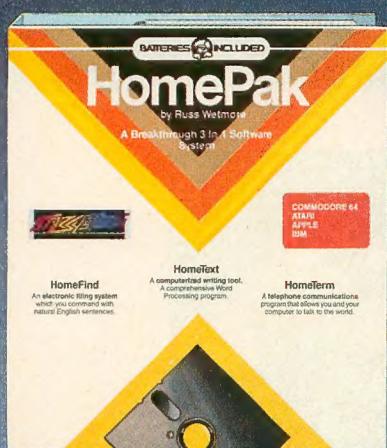
Information management with **HomeFind**

Telecommunications with **HomeTerm**

HomePak features all three programs on a single disk. Each program works smoothly and effortlessly with the others.

Simple enough for the first time user, but with the features and flexibility demanded by the experienced user.

DON'T JUST IMAGINE. DISCOVER
HOMEPAK TODAY AT YOUR
LOCAL SOFTWARE RETAILER.



BATTERIES INCLUDED

Atari and Commodore 64 versions of HomePak are available now. Apple IIe/c and PC Jr editions of HomePak will be available winter 1984.
HomePak will also be released in versions for other major computer systems during 1985.

Each computer system may require accessory devices such as modems, printers or cards to utilize specific features of HomePak. See your dealer for details.

Developed by Russ Wetmore for Star Systems Software for: BATTERIES INCLUDED™ The Energized Software Company™

*Manufacturers suggested U.S. list price. Dealers may sell for less. AD 1984 Batteries Included.

Atari, Apple, Commodore and IBM are registered trademarks of Atari Corp., Apple Inc., Commodore Business Machines and IBM Business Machines Inc., respectively.

For a full colour brochure write to: 186 Queen St. W., Toronto, Canada M5V 1Z1 (416) 596-1405 OR 17875 Sky Park N., Ste. P, Irvine, CA, USA 92714.

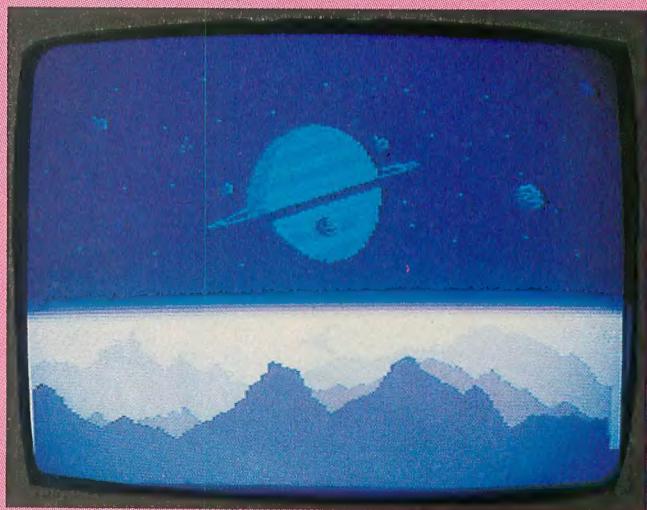
microscreens

Outer space is the theme for two of this month's **Antic** microscreens. G. Manson of Sparks, Nevada presents a mysterious astronaut in "NASA".

San Franciscan Michael Green's ethereal "Moonview" was created using "Fun With Art" software.

We're not sure if our third microscreen, "Buddah" is supposed to be a scene from another planet or another dimension. Steven Dong, a medical school senior at the University of Texas, San Antonio, used up "valuable sleep time" to draw this with his Atari Touch Tablet.

If we publish your Atari computer art on our microscreens page, you get an **Antic** T-shirt. Send your pictures to **Antic** on disk or cassette with stamped self-addressed return envelope. Write loading instructions on a short note telling about yourself and which graphics tools you use . . . also include two choices of T-shirt size and color.



LOTSABYTES DECLARES WAR!

WAR on high prices! We're going to put an end to the software price 'ripoff'. And **YOU** can help! Just keep those orders coming while you continue to enjoy the **quality, quantity, selection and low prices** that you deserve. Our National Public Domain Copy Service will save you time, tedious work, and money. And our **exclusive** distribution of **sharply discounted** commercial programs will bring you some of the finest programs for the lowest possible price, usually 50% off retail! You continue to get **FREE BONUSES** with each purchase of three or more disks.

PUBLIC DOMAIN SOFTWARE

#1 GAMES	#2 UTILITIES	#3 AMS MUSIC	#4 GAMES	#5 EDUCATION
Two full disk sides packed with over 25 games including some Arcade quality. \$7.95	25 powerful programs to help you get the most out of your Atari computer. \$7.95	25 Advanced MusicSystem files including a new Player program. 2 sides. \$7.95	All different! 14 more better games on 2 disk sides. Some Arcade types. \$7.95	Loaded with 28 programs on 2 disk sides. Fun learning for the whole family. \$7.95
#6 AMS MUSIC	#7 GAMES	#8 UTILITIES	#9 GAMES NEW!	#10 UTILITIES NEW!
25 all-time favorites with a Player program. Two sides. \$7.95	Two disk sides packed with 14 more great games. Some Arcade types. \$7.95	17 more power-packed utilities to help unleash the full potential of your Atari. \$7.95	Two full sides filled with some of the best and most recent. Some Arcade. \$7.95	A new assortment of great and powerful programs. Don't miss it! \$7.95

LotsaBytes EXCLUSIVES

ADVANCED MUSICSYSTEM II

by LEE ACTOR

Allows you to create music with your Atari computer! All new machine code.

- * Control over pitch duration, envelope dynamic level, meter, tempo and key.
- * 4 independent voices
- * 5½ octaves per voice
- * Save up to 8200 notes
- * Custom DOS
- * FULL instructions
- * 24K disk

Originally \$29.95

Only \$14.95



ORIGINAL ADVENTURE

by Bob Howell

For all Atari computers.

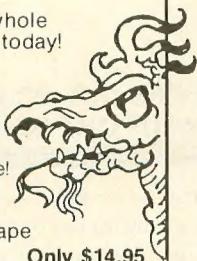
The Original Colossal Cave Adventure faithfully reproduced from the 'mainframes'.

This is the one that launched the whole Adventure craze of today!

- * Two mazes
- * 130 rooms
- * Deadly Dragons
- * Nasty Dwarves
- * Tenacious Troll
- * The Pirate & More!
- * 86 coded hints
- * SAVE/RESUME
- * 40K disk or 32K tape

Originally \$29.95

Only \$14.95



QUALITY WORD PROCESSING

ESI WRITER! At last a brand-new Word Processor that has more features and is easier to use than anything else available for the Atari. Easy for the beginner to use, it asks questions and remembers the answers. ESI WRITER is so sophisticated that it has many more features we don't even have room to mention! Works with ANY Atari.

- * Reads any text file
- * Built in Help screen
- * Very fast! * Works with ANY printer
- * Instant top, bottom or text location without scrolling!
- * Every printer feature
- * DISK ONLY (Any Atari)
- * Search and replace
- * Block move text
- * Page eject/start
- * Set margins/lines etc.
- * Full justification
- * Print headers etc.
- * Block delete etc.
- * Change video color
- * Over 50 pages of docs and tutorials

TRUST US ON THIS ONE! YOU WILL LOVE IT!
Originally \$49.95

LotsaBytes price \$24.95

* * FREE BONUSES * *

If you purchase any 3 or more disks at a time you may choose any 1 of the following disks

FREE!!

- a. The Atari XL TRANSLATOR DISK that enables XL owners to use most 400/800 software. **FREE!!**
- or --
- b. An all different AMS MUSIC disk with Player. **FREE!!**
- or--
- c. Your choice of one of the P.D. disks -- #1, #2, #3, #4, #5, #6, #7, #8, #9, or #10 (specify one) **FREE!!**

Full 100% Replacement guarantee. Any disk found to be defective will be replaced free and we will also refund your return postage. All orders shipped by First Class U.S. Mail. Add \$1.95 shipping and handling for 1 to 5 disks. Add \$2.95 for 6 to 12 disks. California residents add 6% sales tax. Outside of U.S.A. and Canada add 15%. U.S. Funds only. We accept checks or Money Orders. Sorry, no COD or Charge Cards. Allow three weeks for personal checks to clear.

GREAT GAMES!

LotsaBytes Exclusives!

SPACE GAMES: Three games for **one** low price!. In **Aliens** you can't get them all and the pace keeps getting faster. When you do get rid of most of them, you are left in a space quadrant peppered with mines. Will you **Survive?** If you do, you must penetrate the alien's spaceship, survive a **Robot Attack**, and get back your stolen 'cloaking' device! Interested?

\$24.95 list

LotsaBytes price: \$12.95

THE BEAN MACHINE by Steve Robinson is an Award Winning Arcade game that will drive you crazy balancing a series of beans while trying to get all the beans to roll down, without touching, all the while avoiding 'strange creatures' who drop in to steal the beans. It's addicting!

\$24.95 list

LotsaBytes price: \$12.95

DIGGERBONK, another Award Winning game by Steve Robinson, challenges you to find your way through a continuously scrolling maze while avoiding some really strange creatures. Along the way you will need to Bonk some of them, but watch out for the bombs.

\$24.95 list

LotsaBytes price: \$12.95

GUESS WHAT'S COMING TO DINNER lets you try to maneuver a snake through 7 levels if you can keep it from starving or being electrocuted. Lots of surprises! One or two players.

\$24.95 list

LotsaBytes price: \$12.95

* * * *

CREATIVE LEARNING ADVENTURES

Ages 4 to 10 — Disk only

1. Hours of educational fun playing 3 exciting creative adventures with a friendly alien learning about our planet Earth. Hand/eye co-ordination, drawing, and music skills are emphasized.

\$24.95 list

LotsaBytes price: \$12.95

2. Four challenging learning games that are the favorites of our friendly alien. Helps your child to develop logical reasoning ability.

\$24.94 list

LotsaBytes price: \$12.95

3. These 3 Fun-Day learning games will help with intellectual development, hand/eye co-ordination, logic, spatial, and analytical abilities.

\$24.95 list

LotsaBytes price: \$12.95

LOTSABYTES

15445 Ventura Blvd., Suite 10G
Sherman Oaks, CA 91413

Atari is the registered trademark of Atari, Corp.

i/o board

HELP US HELP YOU

I want to praise **Antic** for having the brains to publish "Brain Research with the Atari." I was sure an article like this would have been considered of too limited interest to have been published. Personally, I'd like to hear more about constructive uses of the Atari. I'm tired of games. Why can't your magazine offer a wider spectrum of articles?

Chuck Smithson
Reno, NV

We want to be of use to our readers. The only way we can be of use is to know what readers want to see, and the best way to communicate this is to write us.

—ANTIC ED

CURING COLOR DISTORTION

I have a problem with my BMC color monitor: distortion is caused when I use the RF modulator and my Atari. Contrasting colors aren't sharp, but often bleed several pixels to the right or cast shadows. Even in BASIC, using the default colors, characters cast a shadow about one-third the character width, to the right.

I sent the computer to Atari and they said it was a problem with the 1200XL. When they were done, it was "fixed," several changes had been made in the computer, and the problem still exists. Calling back, I was told they did not know how to fix it. Can you help me?

Michael Rutheford
Houston, TX

We're passing this along to you, our readers. If anyone has a solution, or ideas, let us know. —ANTIC ED

I/O ODDITY

When I work in immediate mode and I write

POKE 710,0: POKE 709,9:
LOAD "D:FILE.EXT"

I hear the loading program sound before the screen turns black. Why?

Ivan Antezana
Lima, Peru

Every 1/30th of a second, during the stage two vertical blank interval, certain registers in the operating system (OS) in

ROM look into related registers in RAM and steal the values for their own use. The RAM registers are called shadow registers to the ROM registers. In the case of your program line, 709 and 710 are shadow registers for locations 53271 and 53272. The program line is being processed so fast by BASIC that it begins execution of the file I/O before the OS registers can get the new color values from the shadow registers. During I/O, the Critical I/O Region Flag at location 66 is set, which suspends the vertical blank transfer process, and the ROM registers have to wait to get their new colors. If you add just the slightest delay after the two POKEs in your line, (such as PRINT CLOG(8)) the registers will have the time to transfer colors and your screen will change before the drive runs. —ANTIC ED

RIBBON RESURRECTION

A tip for Atari 1027 printer owners: If you've had the same trouble I've had finding replacement ink rollers, buy an inexpensive stamp pad inker (roller type) and ink the roller with it. This produces much clearer, better defined letters than even a new roller!

Gene Schoepp
Barnegat, NJ

ACTION! HELP

O.S.S.'s Mike Fitch was kind enough to pass along some information regarding Dave Plotkin's "Lights, Camera, ACTION!" article in the July 1984 issue. The SAVETEMPS and GETTEMPS routines described there are adequate only if the interrupt routine does not perform mathematical operations other than addition and subtraction. The following versions of those routines will work properly in more general cases. Change the arrays in SAVETEMPS and GETTEMPS to the following:

```
SAVETEMPS = "[\$A2 \$07 \$B5 \$C0 \$48  
\$B5 \$A8 \$48 \$B5 \$A0 \$48 \$B5 \$80  
\$48 \$CA \$10 \$F2 \$A5 \$D3 \$48]",  
GETTEMPS = "[\$68 \$85 \$D3 \$A2 \$00  
\$68 \$95 \$80 \$68 \$95 \$A0 \$68 \$95  
\$A8 \$68 \$95 \$C0 \$E8 \$E0 \$08 \$D0  
\$F0]"
```

STAR RAIDERS

In response to Carol Waskowski's inquiry in the July I/O Board about others attaining Star Commander Class 1 in Star Raiders, I can proudly announce that I have obtained that level on many occasions. (Although Star Raiders remains one of the most popular Atari games, only a handful of readers indicated that they have achieved commander 1 status.—ANTIC ED)

The difference between Star Commander 5 and 1 is one's efficient use of energy. Here are some tips to help you save energy and improve your score.

When entering an enemy-occupied quadrant, don't engage your engines. Let enemy ships come to you. Never chase enemies with damaged engines, for the energy you waste is more than the value of the enemy ship.

Attempt to destroy distant ships as soon as they are in sighting range, about 120 centrons. This requires pinpoint firing, but can be done with practice. This helps avoid the close combat that is so deadly at higher levels—hits on your shields cost 100 units each.

Always know where the nearest starbase is, and follow the advice in the third paragraph of survival tactics in the game booklet.

Turn off shields when you're not in combat. This saves energy. There is a chance of asteroid collision, but it is slim.

There are other tips, but this should help. The main idea is to conserve energy.

David Horne
Foster City, CA

WIPE OUT YOUR PROGRAM WITH ONE SIMPLE POKE

For those jaded Atari owners who are looking for just one more thing to do with their machines, we offer the following: POKE 202,1. Place this poke in your favorite program and your program will be wiped from memory when it ends. Your program will also be wiped if you hit [BREAK] or [SYSTEM RESET]. In fact, anything which generates the READY prompt will result in erasure of the pro-

help!

gram. Interesting possibilities for protection schemes, no? Location 202 is the Load in Progress flag. When it has been set (by poking with a 1) the computer begins part of the load procedure immediately following the generation of the READY prompt. Among other things, the load procedure clears all program lines and variables from memory. —ANTIC ED

INVESTIGATING WITH ATARI

I am in the business of motor vehicle accident investigation and reconstruction. Are there any Atari programs available for purchase that deal with accident investigation, vehicle weights and measurements?

Eldon Shannon
Huntsville, AL

We don't know of any, but if anyone does, we'll pass the information along.

—ANTIC ED

INTERFACING COMPUTERS

I own both an Atari and a TRS Model 100. I use the TRS extensively at work and on the road, and the Atari at home. I would like to transfer text and download files from the TRS to the Atari.

Denny Bowen
Crystal Lake, IL

Please see the "Electronic Notebook" article in the July, 1984 issue of Antic. It describes techniques for using the RS-232 connector (you'll need an 850 interface) and terminal software for both computers. This allows the machines to transfer data in ASCII. —ANTIC ED

THE EDGE OF LETTER PERFECT

When using Letter Perfect on my color TV I can't see the first letters on the left. This may be due to the kind of TV I'm using here in the Amazon jungle. Is there anything I can do about this?

Carlos Malaga
Inquitos, Peru

The new Letter Perfect (version 6.0) has a Fix Window Width function that allows you to set the width of your display. Press [CTRL] [3]. If you don't have this updated version, contact LJK Enterprises. —ANTIC ED

MISSING INFOBITS

The assembly language source listing for "Infobits" (Antic, Dec. 1984) was left out of the previous issue. You'll find it in this issue's Software Library. —ANTIC ED

MISSING LINE IN ADVENT X-5

If you're running into a bit of trouble during your adventures in "Advent X-5" (Antic, Nov. 1984), it may be due to a missing line. Add the following line: 8020 RUN. If the program locks up, you may be mistyping line 1005. The "TYPO II" code for that line is EJ. Watch out for the character just before the inverse f in that line, it's a [CTRL] [B].

LITTLE BROTHER INSTALLED PROPERLY

I have found a problem with the installation of a color monitor with my Atari 400.

I used your article "Little Brother Grows Up," (April 1984) for a guide. The schematic on page 106 shows resistor R11 to have a value of 2.2 Ohms. This should be 2.2 kilo Ohms.

Matt Orsie
Budd Lake, NJ

Thanks—this is the first time we'd heard about this. It's harder to test hardware fixes than it is to try new software, and we appreciate all the comments we get.

—ANTIC ED

BIFFDROP

Last month's Game of the Month, "Biffdrop," by J.D. Casten had some pretty tough lines to type in. Now that we have a new "Typo" program, we thought you might like the "Typo II" line-by-line codes followed by the line numbers. See the "Typo II" instruction article in this issue.

MH 510	JE 4002
BQ 515	SB 4003
UC 520	CO 4004
BT 525	YA 4005
AV 580	YA 4006
IV 4000	MM 9000
KP 4001	

ANTIC 4/5 EDITOR

Because of some interesting quirks in the Atari XL screen editing system, the DEMO listing of the "Antic 4/5 Editor Animator," (page 66, October 1984), will not run without the Translator disk. To get DEMO to run without Translator, change both 36's in line 52 to 35, and change the 39 in line 522 to 38.

PLAYFUL PROFESSOR

We would like to thank you for the honorable mention given to us in the October 1984 issue of Antic for our Playful Professor Math Tutor. However, there is a cassette version for the Atari.

Roger Shiffman
Screenplay Intelligent
Statements
Des Plaines, IL

MISSING TANK LINES

In our September Help! column, we ran a letter with improvements for "Use BASIC to Animate". Unfortunately, some lines were omitted from the letter. We print them below.

Add these lines:

```
1301 POKE 752,1:?:?:?"NUMB  
ER OF PLAYERS (2,3, OR 4)"  
?:INPUT K  
1302 IF K<2 OR K>4 THEN ?  
CHR$ (125):GOTO 1301  
1303 ? CHR$ (125)  
1351 IF K<>3 AND K<>4 THEN  
POKE 53249,0  
1352 IF K<>4 THEN POKE 532  
50,0
```

Change these lines to read:

```
1170 D1=D1+1:IF K=4 THEN A  
=PEEK(634):ON ((A=7)+2*(A=  
11)+3*(A=13)+4*(A=14)) GOS  
UB 590,660,730,800:POKE 53  
278,1  
1180 D2=D2+1:IF K=3 OR K=4  
THEN A=PEEK(633):ON ((A=7  
)+2*(A=11)+3*(A=13)+4*(A=1  
4)):GOSUB 310,380,450,520:  
POKE 53278,1
```

Note that line 1180 is overlong and must be entered without spaces.



STARTING A BULLETIN BOARD PART II

Antic Pix BBS Software

by SUZI SUBECK

You read last month's **Antic** article about starting your own bulletin board and you've had an extra phone line installed. You're ready to dedicate your Atari system to a BBS, but... where do you go from here? This month **Antic** answers two of the most frequently asked telecomputing questions, "What is the best BBS equipment—and where can I get it?"

First of all, there is no standard "best" configuration for an Atari-based bulletin board—literally dozens of combinations of equipment will work. What's best for *you* depends on your overall BBS goals, as well as the amount of cash you can spare for this project.

HARDWARE

The heart of a BBS is an auto-answer modem, which will allow your system to function in your absence. Certain modems require the currently hard-to-find Atari 850 interface. You will also need a printer and disk drives. The number and capacity of drives you use will determine the amount of programs you can upload and download.

The annual Buyers' Guide in **Antic** last month gave you our picks of the best modems, disk drives and printers at various price points and with a wide range of features.

SOFTWARE

Probably the most important factor in choosing BBS software is to make sure it's compatible with your hardware—and does all the jobs you want. There are several types of bulletin board software (Also see **Antic**, July and August, 1984). Here's where to get the most popular BBS operating programs:

FOREM will run on any Atari with one to four disk drives of any density—including both 5 1/4-inch and eight-inch disk drives. There are versions that operate with the Atari 850, the ATR 8000 CP/M interface, and other configurations. One version is tailored specifically for the MPP modem.

Matt Singer, the author of **FOREM**, sells all versions of the software from his Maryland home, with the exception of the latest MPP version which is sold directly by MPP for \$50. Singer is currently selling **FOREM XL** for \$100. Once you have purchased a program from Singer, regular updates are available for downloading from his BBS, or you can get updates by sending him a blank disk with \$5 for postage and handling.

AMIS software is in the public domain. Easily downloaded from various bulletin boards, **AMIS** comes in three main varieties, **MACE AMIS**,

Standard AMIS and **Fast AMIS**.

MACE stands for Michigan Computer Enthusiasts. And this large users group makes the software available from the Main **MACE** and **MACE West** boards at least twice weekly. It's a good idea to call ahead and find out what nights **AMIS** will be offered.

Standard AMIS is regularly available for downloading from the **CLAUG** BBS. From time to time, it is also found on most other boards running **AMIS**. You can also get it by sending a blank disk and return postage to the sysop of just about any regular **AMIS** BBS.

Fast AMIS has built-in modem commands for a Hayes Smartmodem. It requires some modification to run with an MPP, Signalman Mark 7 or Mark 12 modem. **Fast AMIS** requires a different method of auto-answer than other BBS programs, and demands a different setting of the modem's internal DIP switches.

Fast AMIS is one of the easiest programs to run because it's virtually self-maintained. Message files compact automatically. The program does not require a printer on-line as **FOREM** does, and the only jobs the sysop must perform are erasing the caller log and rotating uploads and downloads regularly. **Fast AMIS** is available

continued on page 14

CAN YOU SURVIVE **50 MISSION CRUSH?**

50 MISSION CRUSH™, SSI's exciting and unique role-playing wargame, puts you in the cockpit as pilot of the most glamorous bomber of World War II — the B-17 Flying Fortress.

As part of the 8th Air Force 306 Bomber Group stationed in England, you will fly dangerous bombing raids over Nazi-occupied France and Germany. Your goal: To survive fifty missions and achieve the rank of Brigadier General.

After each raid (if you've survived!), you'll be evaluated by the computer and awarded points based on such factors as: How difficult was the mission? How accurate was your bombing? How many enemy fighters did you shoot down? (Just as in real life, enemy fighter pilots get better at shooting down B-17's as time goes by!)

The more points you get, the closer you'll be to a promotion, and ultimately to wearing the General's shiny star.

This game's designer was the flight



engineer on a B-29 bomber during the Korean War, and he's made sure everything about 50 MISSION CRUSH is historically accurate.

Surviving fifty missions and becoming General is no easy task. But if you do make it, send us a photo of the screen as proof, and we'll add to the celebration by awarding you a Certificate of Achievement.

To get your hands on a B-17 bomber, fly on down to your local computer/software or game store today!

FOR THE APPLE®,
ATARI®, and
COMMODORE®
64™

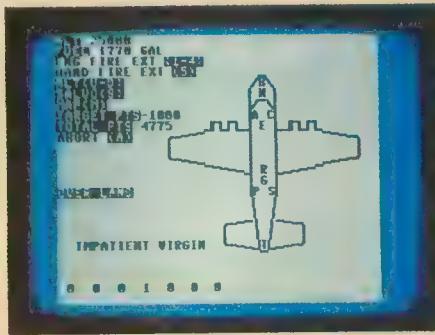


On 48K disk for the Apple® II with
Applesoft ROM, II+, IIe and IIc.

On 40K disk for Atari® home computers. On 64K disk for the C-64™.



Screen display shows your base in England and your 22 targets in France and Germany — all heavily protected by enemy fighters and anti-aircraft batteries.



Data display of your Flying Fortress.



If you survive fifty missions and reach the rank of Brigadier General, we'll mail you this Certificate of Achievement to celebrate your remarkable feat.

ΣΕΙΩ

STRATEGIC SIMULATIONS INC.

If there are no convenient stores near you, VISA & Mastercard holders can order direct by calling 800-227-1617, ext. 335 (toll free). In California, call 800-772-3545, ext. 335. 50 MISSION CRUSH™ goes for \$39.95, plus \$2.00 for shipping and handling.

To order by mail, send your check to: STRATEGIC SIMULATIONS INC, 883 Stierlin Road, Bldg. A-200, Mountain View, CA 94043. (California residents, add 6.5% sales tax.) All our games carry a "14-day satisfaction or your money back" guarantee.

WRITE FOR A FREE COLOR CATALOG OF ALL OUR GAMES.

APPLE, **ATARI** and **COMMODORE 64** are trademarks of Apple Computer, Inc., Atari, Inc. and Commodore Electronics, Ltd., respectively.

STARTING A BULLETIN BOARD

continued from page 12

for downloading from the Valley Girl BBS at least once a week or by request.

Carnival software is essentially AMIS with an overlay to allow for private messages and passwords. It's no longer available from regular sources, but presumably could be obtained from a private owner. Carnival fell from wide usage because it demands a large amount of disk space and requires every bit of memory your system has.

If you plan to operate your BBS with an ATR 8000, you'll need to use MYDOS to boot the RS-232 handler, which will allow you to communicate with your modem. Because MYDOS returns different RS-232 status values than does Atari DOS, and because MYDOS has a different directory structure, you will probably need to modify any BBS software. Differences from the Atari DOS are pointed out

in the MYDOS documentation.

Most sysops are more than happy to help out a sysop-to-be. They can provide you with a set of guidelines to use in setting up your board. Most of the long established systems you call today have experimented with various configurations of hardware and software, so they can offer excellent advice. Help is only a phone call away.

BBS SOFTWARE SOURCES

Fast AMIS

Public domain from Valley Girl
(312) 747-4247

MACE AMIS

Public domain from Main MACE
(313) 978-1685; MACE West
(313) 582-0657

STANDARD AMIS

Public domain from CLAUG
(312) 889-1240.

FOREM XL

\$100. Matthew Singer, 6005 Cherry-

wood Court, Apt. 301, Greenbelt, MD, 20770. (301) 474-7583—voice, 5-8 PM, EST. (301) 474-7591—modem, 24 hours.

FOREM MPP

\$50. Microbits Peripheral Products, 225 W. Third Street, Albany, OR 97321. (503) 967-9075.

Antic Contributing Editor Suzi Sobeck is a sysop and users group newsletter editor based with her family in the southern suburbs of Chicago

BIGGEST BBS LIST STARTS NEXT MONTH!

Starting with February, in the next few issues of Antic we'll print the most complete and current list of Atari bulletin board systems we know of. This list is compiled by the Boise Users Group BBS, it's updated bi-weekly, and names close to 250 active Atari boards.

A

- Storytelling
- Teaching
- Announcements
- Advertising
- Home Movie Titles
- Special Printing

VisualizerTM

the electronic slide creator/projector

"On a one to ten scale ... it's a sure bet 12!"
— CURRENT NOTES October 1984

"Visualizer ... as easy to use as it is useful."
— COMPUTE May 1984

AGES 10 to Adult
For any AtariTM with 48K and disk drive

Atari is a registered trademark of Atari, Inc.

Satisfaction Guaranteed
or Full Refund! * \$49.95

* With prepaid return within 15 days

- Audio Option Available/Narration Tape
- 28 Text Styles/Sizes Included
- 1-2-3 Color Switching Animation
- Rainbow and Sparkle Animation
- Draw/Paint/Fill Routines
- Printer Dump Routines
- Puzzle Game Bonus!



by MAXIMUS

Order Toll Free
1-800-368-2152

6723 Whittier Avenue McLean, Virginia 22101

PITSTOP II. BECAUSE AUTO RACING IS NOT A SOLO SPORT.



When we introduced Pitstop, we created action in the pits. Now, with PITSTOP II, Epyx introduces true competitive auto racing, both on the track and in the pits. Auto racing is not a one man sport. With PITSTOP II, you can now experience the thrill

of speed and competition as you battle your opponent in a race against the clock. Now, more than ever, the strategy of when you make a pit stop and your pit crew's speed and performance, combined with your skill on the track, will determine the winner.

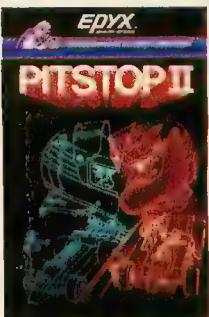
A split screen shows you your position and that of your

opponent, a digital clock displays time and a lap counter gives you your race position as you race against each other in pursuit of the checkered flag. You can also play against the computer or take a few practice laps as you prepare for the real head-to-head competition. Step up to PITSTOP II because auto racing is not a solo sport.

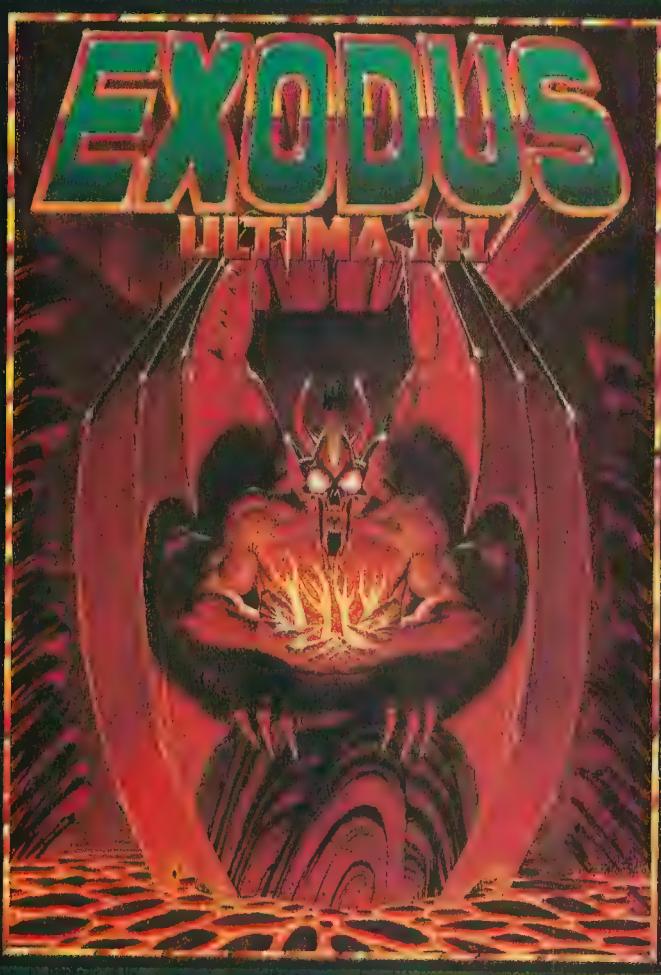
One or two players: joystick controlled; disk or cassette.



Strategy Games for the Action-Game Player



"A LIVING TAPESTRY . . ."



"The world of Ultima III can only be compared to a living tapestry — complex and beautiful . . . This is the best fantasy game in computing. Indeed, it is one of the best fantasy worlds in which to live. Lord British is a veritable JRR Tolkien of the keyboard." — Popular Mechanics

"Exodus: Ultima III, with a superior plot to match its superior gaming system, is a great game. It upgrades the market; in several ways it sets new standards for fantasy gaming state of the art." — Softline

"*Exodus: Ultima III* is Lord British's magnum opus — so far. It's fun and exciting to play and constantly intriguing. And the ending is marvelously unexpected and not a bit disappointing — except that it is the ending, and as with a good book, you'll probably wish there were more." — Softalk

Available on: Apple, Atari, Com64, IBM

ORIGIN

Apple, Apple Computer, and IBM are trademarks of Apple Inc., Cupertino, California. **Commodore Business Machines** and **IBM**, respectively.

BASIC SEARCHER

"Global search" for programmers

by SCOTT SHECK

Global search is one of the most useful editing functions found in good word processing software. Now you can make use of the same powerful editing tool when you're revising or debugging your own BASIC programs.

BASIC Searcher is a utility that can find all the lines containing any BASIC command, operator, function or variable in your program. It is compatible with BASIC XL (O.S.S.) and can be used with any BASIC program having line numbers below 31900.

First, type in the program listing, check it with TYPO II, and LIST it to disk using LIST "D:SEARCH.LST". Cassette owners should type LIST "C:"

HOW TO USE BASIC SEARCHER

Once the computer has a BASIC program in memory, type ENTER "D: SEARCH.LST" or "ENTER C:" to merge your program with BASIC Searcher. Your program MUST be in memory before you ENTER the BASIC Searcher program!

Next, type GOTO 31900. After a brief pause, a list of your program's variables will appear on the screen. Occasionally, this list will include variables which no longer exist. This occurs because BASIC Searcher references your program's Variable Name Table which, in the case of a SAVED file, may have retained previ-

BASIC Searcher finds the lines containing any command, operator, function or variable in your BASIC program. The program works on all Atari computers of any memory size. Antic Disk subscribers, follow the directions in the article.

ously deleted variables. To clear the Variable Name Table, LIST your program to disk or cassette, type NEW, and ENTER your program again.

Each variable in the list will be accompanied by a reference number. To locate a particular variable in your program, type in its corresponding reference number and press [RETURN].

Now, type [S] to have your results printed on the screen, or [P] to have your output sent to a printer.

The program will print an "END OF SEARCH" message when it's through. If you want to perform another search, type [Y]. If not, type [N] and BASIC Searcher will erase itself from your program.

BASIC Searcher can also find BASIC reserved words, constants and character strings. Just type in a reference number from the accompanying Table. If you were looking for every occurrence of the POKE command, for example, you'd type in [31] and press [RETURN].

Although BASIC Searcher will find

all references to specific variables, it cannot isolate individual constants or character strings. If you're searching for constants (reference number 14) or strings (number 15), BASIC Searcher will print out *all* references to *every* constant or string in your program.

HOW IT WORKS

BASIC Searcher looks for *tokens*, the one-byte codes which the Atari's BASIC interpreter uses to represent reserved words, variables and other pieces of information.

Tokens for BASIC reserved words are represented by ATASCII characters 0 through 84. The computer represents your program's variables with ATASCII characters 128 through 255. (This is why a program may not have more than 128 variables.)

As the computer interprets a BASIC program, each variable is assigned a token, beginning with ATASCII 128, and this token is appended to the Variable Name Table. At the same time, the variable's name is added to the Variable Name List, and its value is stored in the Variable Value Table. The computer uses these tables to keep track of your program's variables. BASIC Searcher looks through the Variable Name Table and the Variable Name List when analyzing your program.

continued on next page

Affordable
Memory

FACTORY
DIRECT
SPECIAL!

AXLON

RAMPOWER

PLUG-COMPATIBLE MEMORY

THE DISK EMULATOR

128K RAMPOWER
FOR ATARI 800 \$299⁰⁰

Special "Combo-pack"- 128K/32K \$325⁰⁰
COMPATIBLE WITH SyntfileTM AND SyncalcTM
OF SYNAPSE SOFTWARE CORP

48K RAMPOWER
FOR ATARI 400 \$79⁹⁵

32K RAMPOWER
FOR ATARI 400 OR 800 \$49⁹⁵

COMPATIBLE WITH 128K RAMPOWER

ALLOW 3 to 4 WEEKS DELIVERY



1287 Lawrence Station Road
Sunnyvale, CA 94089

QTY	TOTAL \$
128K RAMPOWER @ 299 00	\$ _____
COMBO-PACK 128K/32K @ 325 00	\$ _____
48K RAMPOWER @ 79 95	\$ _____
32K RAMPOWER @ 49 95	\$ _____
(CA RESIDENTS ADD SALES TAX)	\$ _____
ADD SHIPPING + HANDLING	\$ 5.00
TOTAL \$	_____

ENCLOSED IS MY:

Check/Money Order No. _____

VISA/Master Charge No. _____ Exp. Date. _____

Name _____

Address _____

City _____ State _____ Zip _____

Signature _____ Date _____

CALL NOW TO ORDER

**(408)
747-1900**

the toolbox

REFERENCE NUMBER TABLE

- 0 REM
- 1 DATA
- 2 INPUT
- 3 COLOR
- 4 LIST
- 5 ENTER
- 6 LET
- 7 IF
- 8 FOR
- 9 NEXT
- 10 GOTO
- 11 GO TO
- 12 GOSUB
- 13 TRAP
- 14 all constants or BYE
- 15 all strings or CONT
- 16 COM
- 17 CLOSE
- 18 CLR or ,
- 19 DEG or \$
- 20 DIM or :
- 21 END or ;
- 22 NEW
- 23 OPEN
- 24 LOAD
- 25 SAVE or TO
- 26 STATUS or STEP
- 27 NOTE or THEN
- 28 POINT or #
- 29 XIO or <= [arithmetic]
- 30 ON or <>
- 31 POKE or >=
- 32 PRINT or <
- 33 RAD or >
- 34 READ or =
- 35 RESTORE or
- 36 RETURN or *
- 37 RUN or +
- 38 STOP or -
- 39 POP or /
- 40 ? or NOT
- 41 GET or OR
- 42 PUT or AND
- 43 GRAPHICS or (
- 44 PLOT or)
- 45 POSITION or = [arithmetic]
- 46 DOS or = [strings]
- 47 DRAWTO or <= [strings]
- 48 SETCOLOR or <>
- 49 LOCATE or >=
- 50 SOUND or <
- 51 LPRINT or >
- 52 CSAVE or =
- 53 CLOAD or + [unary]
- 54 Implied LET or _
- 55 ERROR [syntax] or ([strings]
- 56 ([arrays]
- 57 ([DIM arrays]
- 58 ([functions]
- 59 ([DIM strings]
- 60 , [arrays]
- 61 STR\$
- 62 CHR\$
- 63 USR
- 64 ASC
- 65 VAL
- 66 LEN
- 67 ADR
- 68 ATN
- 69 COS
- 70 PEEK
- 71 SIN
- 72 RND
- 73 FRE
- 74 EXP
- 75 LOG
- 76 CLOG
- 77 SQR
- 78 SGN
- 79 ABS
- 80 INT
- 81 PADDLE
- 82 STICK
- 83 PTRIG
- 84 STRIG

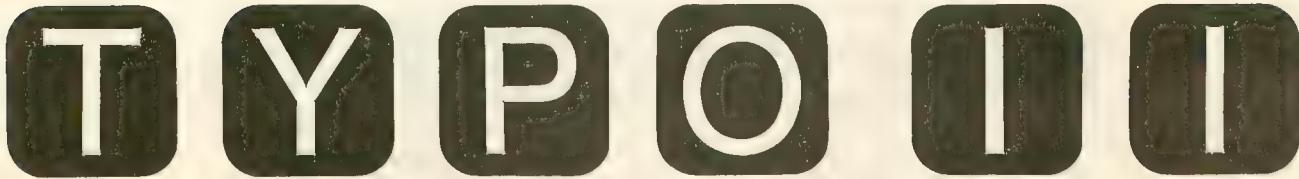
Scott Sheck is one of the most creative and prolific utility programmers appearing in Antic. Last month's issue featured his "Word Storage Space

Saver," an almost fiendishly clever method of reducing memory waste in text storage.



Listing on page 53.

Introducing



Easier proofreading for Antic type-ins

TYPO (Type Your Program Once) by Bill Wilkinson of Optimized Systems Software started in the third issue of **Antic**—August, 1982. It was the first automatic proofreading program for type-in listings ever printed in a computer magazine. We reprinted TYPO several times and have been using it with all our listings ever since—but now TYPO is going into a well-deserved retirement.

ENTER TYPO II.

The main trouble with the original TYPO is that it didn't show exactly what line contained a typing mistake. This made it too hard for beginners to use comfortably.

But TYPO II pinpoints every mistyped line—immediately after you type it. It can also find transposed characters which were invisible to its predecessor.

TYPO II even lets you use abbreviated commands. But don't mix up PRINT with [?].

Antic tapped Andy Barton ("Info Bits," Dec., 1984) to write TYPO II. Andy cheerfully put the program through an extensive debugging process to make it compatible with all Atari computer models. Then when we believed the program was perfected, we asked Bill Wilkinson to look at it. And Bill contributed some

ideas that enabled Andy to make TYPO II even shorter and simpler.

—ANTIC ED

HOW TO USE TYPO II

TYPO II finds the exact lines where you make mistakes while typing in **Antic** BASIC listings. This short all-BASIC proofreading program starts in the January 1985 issue; it works with all Atari computers of any memory size.

Type in TYPO II and SAVE a backup copy to disk or cassette. (Users of the O.S.S. Basic XL cartridge must type SET 5,0 and SET 12,0 before they RUN the program.) To start TYPO II, type GOTO 32000. The TYPO II screen should appear, displaying the instruction, "Type in a program line."

Respond by typing in the first line of any 1985 **Antic** BASIC program. You will see the line reappear near the bottom of the screen—with a two-letter code at the left of the line number. Check these code letters against the correct two-letter code printed left of the same line in the magazine listing.

If the codes don't match exactly, you mistyped something in *that* program line. Simply press [RETURN] and the line will move back towards the top of the screen for editing. Don't type in those two-letter correction codes as part of the program line.

When the codes are an exact match, just type the next program line.

IMPORTANT: To call up *ANY previously typed line* for checking with TYPO II, type an asterisk [*], followed (with no spaces in-between) by the number of the first program line you want to proofread. Then press [RETURN]. Use this procedure to check every line of TYPO II before you proofread other **Antic** programs with it.

You can LIST your program by pressing [BREAK] and typing LIST. Switch back into TYPO II anytime by typing GOTO 32000.

To remove TYPO II from your program: Type LIST "D:FILENAME",0, 31999 (Cassette owners LIST "C:",0, 31999). Type NEW, then ENTER "D:FILENAME" (ENTER "C:" for cassettes). Your program is now in memory without TYPO II and can be SAVED or LISTED to disk or cassette.

(Of course, if you still get tired of typing in all six-or-more listings per issue—you can subscribe to **Antic Magazine + Disk** for only \$99.95 yearly, and send for back issue disks at just \$12.95 each. See order forms in this issue.)



Listing on page 52.

INTERVIEWING DAN BUNTEN

Designer of "Seven Cities of Gold" & "M.U.L.E."

by ARTHUR LEYENBERGER

Ozark Softscape is located in the game design hotbed (?) of Little Rock, Arkansas and it has created two of the most impressive games available for the Atari—the 1983 award winning science-fiction economic simulation *M.U.L.E.* and 1984's graphics-scrolling conquistador simulation *Seven Cities of Gold*. Both of these remarkable games are marketed by Electronic Arts (2755 Campus Drive, San Mateo, CA 94403, 415-571-7171).

The principal game designer and most visible spokesman of Ozark Softscape is Dan Bunten, whose earlier games include *Computer Quarterback*, *Cytron Masters*, and *Cartels & Cutthroats*.

The rest of Ozark Softscape consists of:

Bill Bunten, Dan's brother, who has a Master of Business Administration degree and shares the design responsibility with Dan as well as being the primary play tester.

Jim Rushing, another MBA, who is kept busy writing most of the heavy-duty number-crunching code for the Ozark games.

Alan Watson, whose specialty is graphics and animation programming. He has a math background and ten years' experience in high-end stereo retailing.

Ozark Softscape has developed a game development routine, during its two years of existence. All four members decide what type of player

experiences they want in their next game. Then Dan or Bill will produce a topic, flesh it out and bring it in for discussion. After the opening rounds, Dan and Bill come up with a game skeleton, including memory requirement estimates. From there, the work, and the fun, really begins.

Dan Bunten does not fit the programmer stereotype. Although he is an engineer by training, he prefers not to talk of bits and bytes but about what can be created with leading-edge technology. His interests range widely, from social biology to science-fiction, from philosophy to history and education . . .

Antic: How did you get the idea for *Seven Cities*?

Bunten: When my brother Bill and I were kids, my uncle gave us a book on the Conquistadors and we thought, Wow! Then there was a strategy board game from SSI, a war game called Conquistador that was part of their magazine. That was neat but it was awfully unplayable. We had a list of themes that were of interest to us and when we were ready to begin a new project we did not want to do another multi-player game like *M.U.L.E.* So we looked down the list and said, "Here's Conquistador."

Actually, we were not too excited about it at first. But as we started to do the research on it, we thought we could really do something good. After two months of research and just free-flowing ideas, we spent another

month writing the story boards. Then six months of coding and it was out. **Antic:** How far into the initial research phase do you go before you decide whether the concept will succeed?

Bunten: Normally, we just try to push through. To a certain extent we can always figure something out. Since there are a lot of people involved somebody will usually have an idea. There are the four of us in Ozark Softscape, there's our publishers at Electronic Arts, our play testers—somebody is going to come up with something.

The big idea with *Seven Cities* is the concept of Discovery. We have a giant world; spread it out, and it would be 12 by 20 feet. You are sitting there with a 3-1/2 inch window on this 12 by 20 foot world. That's big. You will never have a sense of knowing everything. You get lost or end up in the boonies.

The other things were to keep a pace going, to be fun, be easy. To transfer things was the most awkward part of the game. Yet it is actually pretty simple compared to other alternatives. But next time we will do those even better.

Antic: I think the game really does capture the flavor of what the Conquistadors must have been feeling. Especially with the random continent feature.

Bunten: Yes, in a random continent game, even when you find land, you

don't know what will be there. You can end up with a randomly generated continent full of a higher tech civilization than the Europeans.

Our model for that was the Japanese and Chinese. If the Conquistadors had landed in China or Japan, the Europeans would not have had a chance. They couldn't have come in and said, "We are going to blow you away and take everything you've got." They would have been lucky to get enough food to go back home.

Antic: When I first received Seven Cities, I thought, "Oh no, the manual doesn't tell you anything!" Then I started playing the game and figuring things out. The manual gives a historical perspective.

Bunten: Most people would just start playing the game. We looked at the possibility of not having to use a manual. We gave our testers just a disk and didn't say anything. It didn't go over wonderfully but some people loved the idea of discovering all of it.

And then I would get a call from somebody saying, "I can't get off my ship." They had never pushed the button standing still, to find the pull down menus. And "Drop Stuff Off" didn't sound like how you would get off your ship. Some of that has to be explained.

Antic: I thought "Drop Stuff Off" sounded a little strange.

Bunten: We pondered over that. If Antic readers can come up with a better phrase, we might even change it for the next version of the game. We were going to drop "stuffy" off (a Spanish word for it). We thought about "Transfer". Actually it was my wife's idea. I explained to her that what we were trying to do was drop stuff off, and she said why don't you just call it that. So we put it into a preliminary version and it stayed.

Antic: One feature of Seven Cities that I find difficult to understand is the way you might bump into the natives and accidentally kill them.

Even when I am very careful, I still end up killing a few innocent natives.

Bunten: Because you don't share a language with the natives, your only

way of communicating is by the gestures you make . . . your body language. All the natives can look at is

continued on page 25

In Seven Cities of Gold you're a Conquistador and ship captain searching for new worlds and treasure.

Funded by the crown and outfitted with men and supplies, you sail west into the unknown. Awaiting your expedition are over 200 villages of small tribes and the great cities of the Aztec and Inca empires. Your game can use historically accurate geography and 16th century demographics. Or you can choose to face the total unknown of computer-generated random continents.

Ozark's other game, M.U.L.E. takes place on a distant planet, where up to four players (only two players if you have an Atari XL) must either compete or cooperate to colonize this world in the allotted food, energy, Smithore and Crystite

time. The four basic commodities—are used by the players to increase their wealth and the overall well-being of the settlement.

M.U.L.E., for "multiple use labor element," represents a machine that allows colonists to get things done. During each round, players must vie for plots of real estate. Then they choose whether to produce energy or food, or to mine their land for Smithore (used in the manufacturing of M.U.L.E.s) or Crystite (much like diamonds). Players then sell surpluses and buy commodities.

M.U.L.E. demonstrates a free enterprise system at work. Prices are set by supply and demand, economies of scale exist and the learning curve theory of product provides increased output over time.



OSS WRITES ONLY PRECISION SOFTWARE... OUR CUSTOMERS WRITE OUR BEST ADS!

BASIC XL

"BASIC XL is a fast and powerful extension of Atari BASIC, totally compatible with virtually all software. Its many features make programming easy, especially games that require player/missile graphics. For people writing business software or translating existing programs from other computers, the new string arrays and other string-handling features make the task manageable. BASIC XL is a truly professional language that should become standard in all future Atari computers. Overall Rating—A." *The Addison-Wesley Book of Atari Software 1984*

BASIC XL SuperCartridge & Manual (Requires 16K Memory) \$99.00

ACTION!

"For those who have found BASIC to be too slow or assembler to difficult, ACTION! is the logical alternative. ACTION! programs can increase speed from 50 to 200 times that of BASIC." *Jerry White, Antic, February 1984*

ACTION! SuperCartridge & Manual (Requires 16K Memory) \$99.00

MAC/65

"For the serious machine language programmer or anyone interested in programming in 6502 machine language, this package is a must. A lot of the good professional software on the market, games or otherwise, was written using this brute. Coding machine language with anything else is like trying to swim upstream in quicksand." *ACE Of West Hartford, May 1984*

MAC/65 SuperCartridge & Manual (Requires 16K Memory) \$99.00

THE WRITER'S TOOL was designed for WRITERS who want to WRITE!

When you want to write on your Atari® Computer—a letter, a business report, or a book—you want to concentrate on writing and not on the word processor that you are using.

You want to write immediately without having to spend hours learning some fancy system or remembering complicated commands.

You want to write quickly...as fast as your imagination can fly. Then edit just as fast...correct mistakes; change, add, or delete words and phrases; rearrange the sequence of paragraphs or entire pages without fearing that one slip of your fingers might wipe-out hours of precious work.

You want to be able to save or retrieve your text files on any type of Atari compatible disk drive using either single-density or double-density disks without worrying about accidentally erasing files.

You want to be able to print out your finished piece right away, using all of your printer's capabilities such as Pica, Elite, and condensed type; print two-columns on 8½" wide paper and proportional spacing; and print different types of characters: double-width, bold-face, *italics*, underlined, ^{superscript}, and _{subscript}.

Compare THE WRITER'S TOOL with the others: feature for feature, dollar for dollar—if you can find a better word processor, buy it!

THE WRITER'S TOOL*

SuperCartridge, Program Disk, Tutorial & Reference Manual \$129.95

*Requires an Atari® Computer with 40K memory, disk drive, and any Atari compatible printer.

ATARI® is the registered trademark of ATARI, INC.

Now Available At Your Software Dealer!



Optimized Systems Software, Inc.

1221B Kentwood Avenue, San Jose, California 95129 (408) 446-3099

SURVIVAL OF THE SMARTEST . . .

*Outsmart your Friends.
Outwit the Dragon.
Join the Quest.*

Here are just a few of many screens.



THE CHALLENGE.

Over 2000 stimulating trivia/fact questions will send you rummaging through your personal memory banks. Answer correctly and advance in your quest while adding more gold to your treasure. Fail and you lose ground.



THE ACTION.

You may have to face and battle a ferocious dragon. If you prevail, the dragon's cache of gold will be added to your treasure. If you fail, your journey will be slowed while you heal your wounds.



THE STRATEGY

Each questing party consists of three characters, a Knight, Prince and Page. Each has distinctly different physical characteristics, and all must complete the Quest. You must decide when to send them on to the next challenge.

Atari is a trademark of Atari, Inc.
© 1984—Royal Software

EXCITING, NEW
& DIFFERENT!

48K Atari Disk
\$39.95

Challenging excitement for 1 to 4 adventurers

outsmart your Friends • outwit the Dragon • Join the Quest

Trivia Quest is a totally new concept in computer games that will challenge your mind... test your arcade skills... and call upon your best strategy.

PROGRAM COVERS FOUR DISK SIDES!

Royal Software

SOFTWARE FIT FOR A KING!

This exciting new concept in computer entertainment will keep you and your friends involved for hours and hours. This is probably the best party-game ever developed, and new question disks will be available. **Optional:** Utility disk which allows you to create unlimited trivia questions and answers for educational or entertainment. The utility disk also includes over 1000 additional questions. **Utility disk \$24.95.**

Royal Software



"Software fit for a king!"

2160 W. 11th • Eugene, OR 97402 • (503) 683-5361

Ask for Trivia Quest at your favorite Atari Computer Store or order directly from Royal Software. Use your MasterCard, Visa, American Express, or send check or Money Order including \$2.90 shipping and handling.

Turn your Atari into a Ferrari.

Introducing the all-new 1984 Indus GT™ disk drive. The most advanced, most complete, most handsome disk drive in the world.

A flick of its "Power" switch can turn your Atari into a Ferrari.

Looks like a Ferrari.

The Indus GT is only 2.65" high. But under its front-loading front end is slimline engineering with a distinctive European-Gran flair.

Touch its LED-lit CommandPost™ function control AccuTouch™ buttons. Marvel at how responsive it makes every Atari home computer.

Drives like a Rolls.

Nestled into its soundproofed chassis is the quietest and most powerful disk drive power system money can buy. At top speed, it's virtually unhearable. Whisper quiet.

Flat out, the GT will drive your Atari track-to-track 0-39 in less than one second. And when you shift into SynchroMesh DataTransfer™ you'll increase your Atari's baud rate an incredible 400%. (Faster than any other Atari system drive.)

And, included as standard equipment, each comes with the exclusive GT DrivingSystem™ of

software programs. World-class word processing is a breeze with the GT Estate WordProcessor™. And your dealer will describe the two additional programs that allow GT owners to accelerate their computer driving skills.

Also, the 1984 Indus GT is covered with the GT PortaCase™. A stylish case that conveniently doubles as a 80-disk storage file.

Parks like a Beetle.

The GT's small, sleek, condensed size makes it easy to park.

So see and test drive the incredible new 1984 Indus GT at your nearest computer dealer soon.

The drive will be well worth it.



INDUS™

The all-new 1984 Indus GT Disk Drive.

The most advanced, most handsome disk drive in the world.



INTERVIEWING DAN BUNTER

continued from page 21

whether your gestures seem neutral or hostile. The potential for missed cues on both sides is enormous. It may be stretching it, but we actually designed that specifically. Unfortunately it ended up looking like an arcade game that doesn't quite work, because these guys just bump into things and die.

Antic: Do you have any strategy tips for playing Seven Cities?

Bunten: The peaceful approach really works best. I have not used a totally depraved approach and won. You've got to have some friends somewhere. If something goes wrong, you need a friendly mission where you can go back and not have to worry about an insurrection or something. A place you can return to and know that there will be food, for example. You need a series of these relatively safe places even if you are going on a conquest mission.

If you continually abuse the natives you will eventually see a message from the king saying "Don't treat the natives so badly. But keep the gold coming." This double standard is straight out of history.

Antic: You treat the morality question in an interesting way.

Bunten: I do not want to preach to the player what is right and wrong. But I want to give them a chance to get in touch with themselves about how they do feel. In play testing we found that people would rationalize why they used force against the natives. They would say things like, "I only did it because the natives asked for too many gifts". People felt they had to explain their behavior.

Antic: How do you win Seven Cities?

Bunten: However you want. Seven Cities is a process type game, you go along like real life. Life doesn't have ends and wins and things like that. It has processes that you go through and at times you stand back and say, "Hey,



SEVEN CITIES OF GOLD

I've done pretty good so far." Set your own goals really high and say, "That's how I win." Then go for it.

Antic: In a way, this is really a learning game.

Bunten: Learning and fun are not mutually exclusive terms. Play is an important element in our lives. It is unfortunate that as adults we tend to regard play as a separate activity which you do when you have a little free time—rather than say there is a natural joy in learning.

As adults, our real joy comes from learning new things. Discovering or learning something new is done for pleasure. That's what it is all about. Having the opportunity to expand yourself, that's what is entertaining and educational.

Antic: How did you become involved with programming?

Bunten: I started out in Industrial Engineering and one of the first courses we had to take was programming, Fortran on a big IBM. The first time I got it to print $A + B = C$ I was so excited. I did it and then I figured out that I could also make it print out little pictures with letters on a line printer. I thought it was wonderful and I knew someday I was going to have my own computer, but I figured that I would have to be a millionaire first.

As it turned out, I got my first Apple computer in 1979 and I could do things at home. I was working as an Industrial Engineer and had access to a computer at work. So I wrote a few games for the enjoyment of myself

and friends. I did some really goofy stuff.

Antic: Are you limited because of the hardware?

Bunten: That's a cop-out if we blame the hardware. The hardware helps but it isn't all there is. Look at the hardware of a book. I mean it is black and white on a piece of paper and yet it comes across. It's grammar among other things. We don't even know the software's grammar yet, much less how to develop characters and carry a plot line. We have a ways to go and are really at the beginning. But it is fun to be part of it.

Antic: What was your first commercial program?

Bunten: Wheeler Dealer. No one remembers it, only a hundred were sold. It was a 16K cassette game for the Apple. Integer Basic, and it required this hardware thing we made ourselves to allow four people to do the bidding in the game.

Antic: Does a person who wants to break into the game design field have to be a super coder?

Bunten: Not necessarily. There are a lot of good designers around who aren't great programmers. But knowledge of coding helps. Because you know the machine and when you push the boundaries you know what you can and cannot do. Knowing about human engineering also helps.

Antic: The human interface is really one of the strong points of Electronic Arts products. Their ease of use is a hallmark.

Bunten: It's amazing—M.U.L.E. was done years ago in an entirely different form for a 16K Apple—a real-time stock market simulation. It didn't go anywhere and probably never could have if it wasn't for a company like Electronic Arts. Their ability to support and guide us and to pull together ideas really helped. And patting us on the back, too, because we need a lot of that. We are out in the boonies and

continued on page 28

YOU HAVE ALREADY MADE YOUR FIRST MISTAKE!

You thought that cassette recorder would handle your storage needs.

WRONG

DON'T MAKE ANOTHER ONE!

You think you need a disk drive to solve your storage problems.

WRONG

YOU NEED 2 DISK DRIVES!

Any serious application practically demands at least 2 drives.

WORD PROCESSING

SPREADSHEET

DATA BASE MANAGEMENT

MAILING LIST SOFTWARE

All of these are made more powerful and, at the same time, easier to use if you have two disk drives.

So now it will cost twice as much, right?

WRONG

You need an Astra single or double density dual disk drive. Two drives in one

AND NOW ASTRA HAS THREE MODELS FOR YOUR ATARI

ASTRA 1620

Our original single or double density dual disc drive.
Two drives, for the price of one.
(360 KBYTES)



ASTRA 2001

All of the features of the 1620, but with improved circuitry, rotary doors, and direct drive motors.
(360 KBYTES)

ASTRA "BIG D"

Double sided, single or double density,
dual disk drive.
(720 KBYTES)

ALL DRIVES FURNISHED WITH SMARTDOS OR MYDOS *

*DOUBLE SIDED DRIVES

**FOR NEAREST DEALER OR DISTRIBUTOR
CALL (714) 549-2141**

***ASTRA SYSTEMS**

2500 South Fairview • unit L • Santa Ana, Ca. 92704

INTERVIEWING DAN BUNten
continued from page 25

the attitude of people we deal with is "You write games for a living?" I really have to justify myself to my in-laws.

Antic: Can you talk about your next project?

Bunten: I could if I knew. We have a lot of ideas though. So we rented two cabins on a lake and are going on a retreat next week where we will relax and talk about what's next.

Antic: To what extent do you think a person's program reflects their personality?

Bunten: To an amazing extent. There are several people that I have not yet met, but I think I kind of know what they are like just having seen their games. You can tell if the guy was willing to get into the nitty gritty with-

out concern for complexity. This is called dirt in war game programming terminology and some people actually enjoy the dirt and they will create games with a lot of it.

Antic: Do you think of yourself as a programmer turned artist or an artist turned programmer?

Bunten: None of the above really. I like the idea of being an artist but I think there is a lot more to be done and it is presumptuous to put that label on yourself. Real artists do things that pull your emotions in. A good film or a good book can play you like a fiddle.

Antic: Doesn't Seven Cities do that? When I get lost at sea for example, I'm very upset. My emotions are drawn in by the game.

Bunten: It is a start, a small step towards being able to do that. We have

learned a little bit and have made a step. But the spectrum of emotions that we can create and trigger in software is limited right now. We are not yet to the point where you are going to cry because your character died. I want that, but we won't see it until the software technology matures more.

Arthur Leyenberger is a human factors psychologist in New Jersey. He does microcomputer consulting and freelance writing. He's been an Atari activist for about three years. In fact, he conducted this interview while waiting at the airport with Dan Bunten after the game design star spoke to a users' group.



610 Middle Street
Fairborn, OH 45324

MasterCard VISA

ORDERS ONLY PHONE: 1-(800)-282-0333
INFORMATION LINE: 1-(513)-879-9699

SOFTWARE**ATARI**

Assembler Editor (R)	\$29
AtariWriter (R)	\$35
Atari Basic (R)	\$45
Microsoft Basic II (D & R)	\$59
Atari Logo (R)	\$69
Macro Assembler (D)	\$25
Music Composer (R)	\$20
SynCalc (D)	\$55
SynFile (D)	\$55
SynTrend (D)	\$55
Eastern Front (R)	\$15
Football (R)	\$15
QIX (R)	\$15
Tennis (R)	\$15
Caverns of Mars (R)	\$17
Jungle Hunt (R)	\$17
Pengo (R)	\$17

ACCESS

Beachhead (D)	\$27
Raid over Moscow (D)	\$29
Scrolls of Abadon (D)	\$27

ELECTRONIC ARTS

Archon I, II (D)	ea. \$29
Cut and Paste (D)	\$35
Financial Cookbook (D)	\$35
M.U.L.E. (D)	\$29
Murder on Zinderneuf (D)	\$29
Music Construction Set (D)	\$29
One on One (D)	\$29
Pinball Construction Set (D)	\$29
Realm of Impossibility (D)	\$25
Seven Cities of Gold (D)	\$29
Standing Stones (D)	\$29

AVALON HILL

Dnieper River Line (C) (D)	\$25
Jupiter Mission (D)	\$42
Panzer Jaed (C) (D)	\$25
TAC (D)	\$32
Tanktics (D)	\$25

EPYX

Dragonriders of Pern (D)	\$25
Pitstop II (R)	\$29
Silicon Warrior (R)	\$25
Summer Games (D)	\$25
World's Greatest Baseball (D)	\$29

AD #10

SCARBOROUGH

Masterype (R) \$27

SUBLOGIC

Flight Simulator II (D) \$38

HARDWARE

800 XL computer \$189

410 recorder \$45

1010 recorder \$59

1020 40-column printer/plotter \$65

1025 80 column dot matrix \$199

1027 letter qual printer \$255

Okimate 10 color printer \$239

for Epson, NEC, Okidata, Star Micronics printers CALL

MPP 1150 printer interface \$79

MPP MicroPrint interface \$59

1050 disk drive \$234

Indus GT disk drive \$299

Sakata SC 100 color monitor \$229

Gorilla monitor (green or amber) \$89

Atari 1030 direct connect modem \$65

MPP 1000C AD/AA modem \$129

Atari Touch tablet \$55

Koala Pad \$67

Atari Light Pen \$45

Mosaic 48K (400 800) \$99

Mosaic 64K (400 800) \$99

Atari 400 keyboard \$69

ORIGIN SYSTEMS

Ultima III (D) \$39

Ultima IV (D) \$45

RESTON

Moviemaker (D) \$39

SIERRA

B.C.'s Grog's Revenge (D) (R) \$32

Homeworld (D) \$41

Homeworld & Speller (D) \$82

Wiztype (D) \$39

SSI

Battle for Normandy (D) \$29

Carrier Force (D) \$39

Geopolitique 1990 (D) \$39

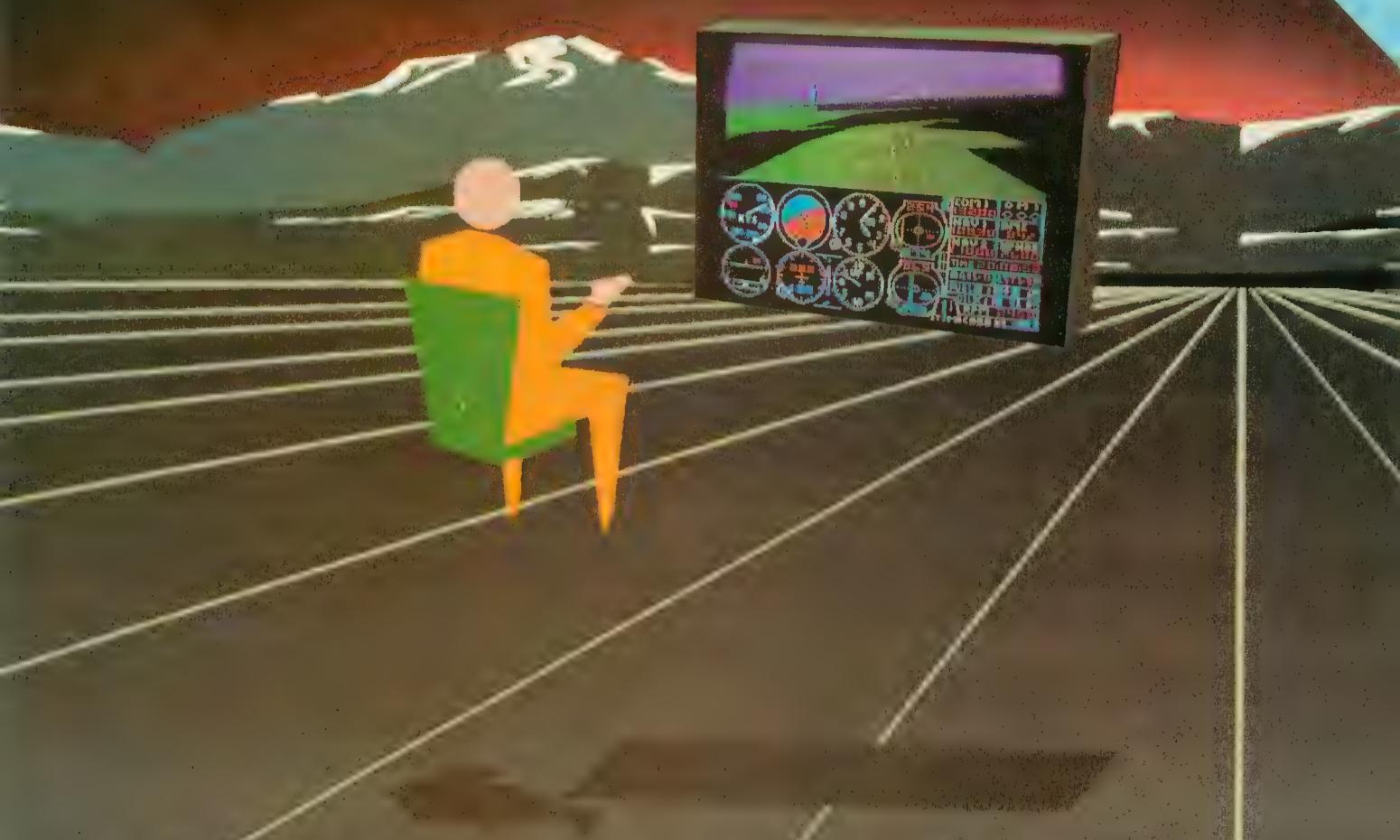
Questron (D) \$37

(C) Cassette Tape (D) Disk (R) ROM Cartridge

Software orders over \$30 free shipping UPS, continental U.S. only. Add \$2 shipping orders under \$30. C.O.D. \$5 extra. Ask for hardware freight charges. Ohio residents add 5.5% sales tax. All items subject to availability and price change. We sell items guaranteed by manufacturer. Due to our low prices, we will not honor unauthorized returns. (Call info. line for authorization.)

Flight Simulator II

For
Atari computers
with 48K memory



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying mode ■ over 90 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

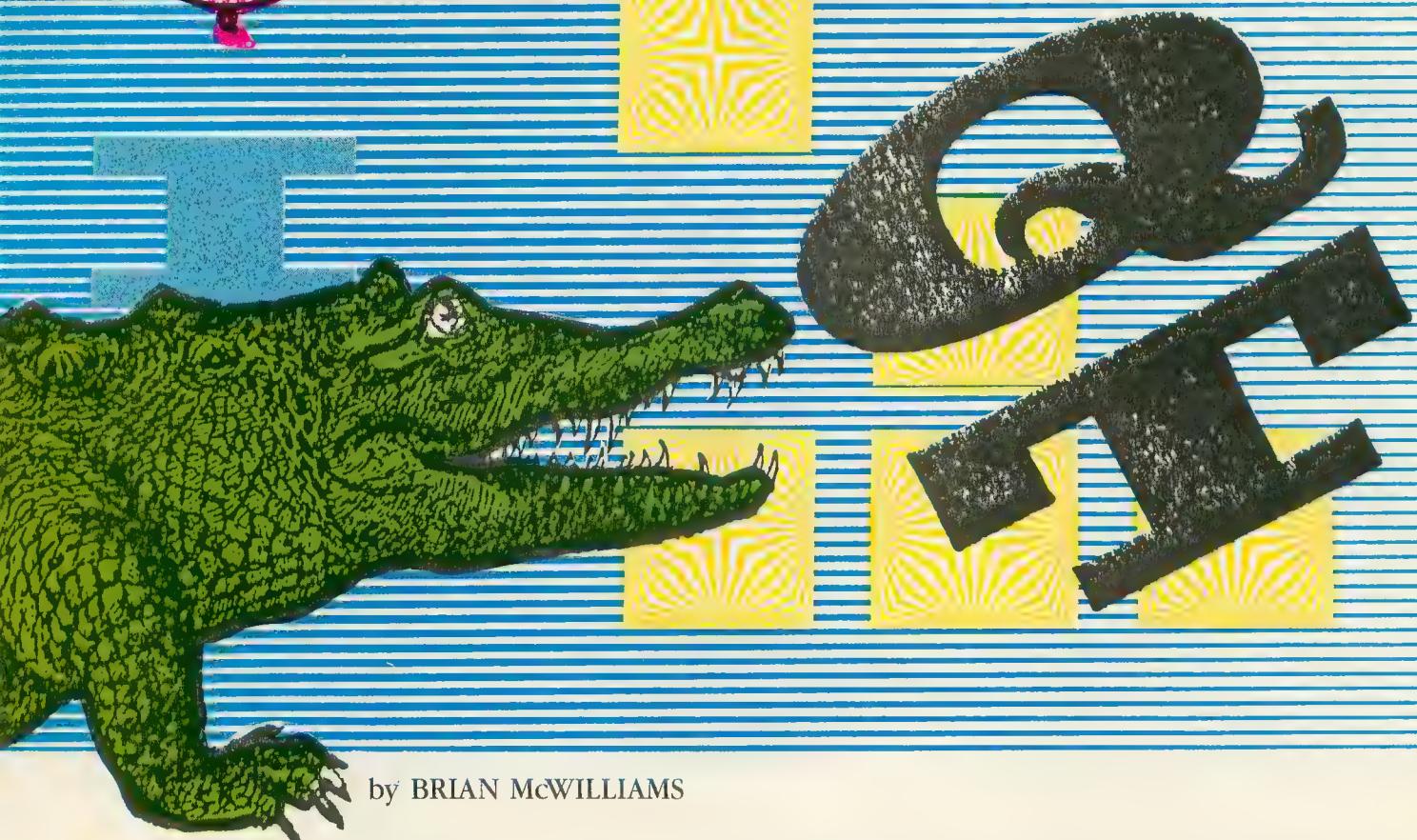
See your dealer . . .

or write or call for more information. For direct orders please add \$1.50 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

Order Line: 800/637-4983

subLOGIC
Corporation
713 Edgebrook Drive
Champaign IL 61820
(217) 359-8482 Telex: 206995

game of the month



by BRIAN McWILLIAMS

Q.T. is an inventive arcade game boasting three different screens, each with six increasingly nerve-wracking levels of difficulty. The BASIC program runs on all Atari computers with 24K memory for cassette or 32K for disk. Antic Disk subscribers, RUN 'D:QT.BAS'

Meet Q.T., a cute little bird who lives inside a dangerous arcade game. If you care about wildlife preservation, you'll help Q.T. survive six increasingly difficult levels of game play—on three different screens.

The first screen is crowded with ice cubes as Q.T. races the timer to put four corner blocks in their assigned positions. Q.T. gets points for eating cubes, or kicking them against the side walls with the joystick button. If the timer runs out before the (inedible) corner blocks are all correctly placed, "Bye bye, Q.T." There's less time at each higher level.

Your score is displayed in the upper left corner, the number of remaining lives is at the upper right. Displayed

at the lower right are all bonus objects collected. High score also remains displayed until the computer is turned off.

A bonus object waits on a platform at the right of the second screen, while a deadly snapping jaw threatens from the left. Q.T. stands at the bottom of the playfield and can only move left or right—while catching objects falling from the top. Every missed object brings the snapping jaw closer; every object caught brings the bonus object nearer. Oh yes, Q.T. must dodge some of the falling objects—birdie-crushing I-beams.

Q.T. takes to the air in the third screen, trying to pop as many balloons as possible. Each balloon carries an item worth points. Q.T. moves left or right with the joystick. Pressing the fire button causes Q.T. to flap. Without flapping, Q.T. glides down. Balloons move faster in the higher levels.

Q.T. can die by gliding off the screen, or by getting crushed with a falling object. If all six levels of the

game are survived, Q.T. will be safe at last on the "You Win!" screen.

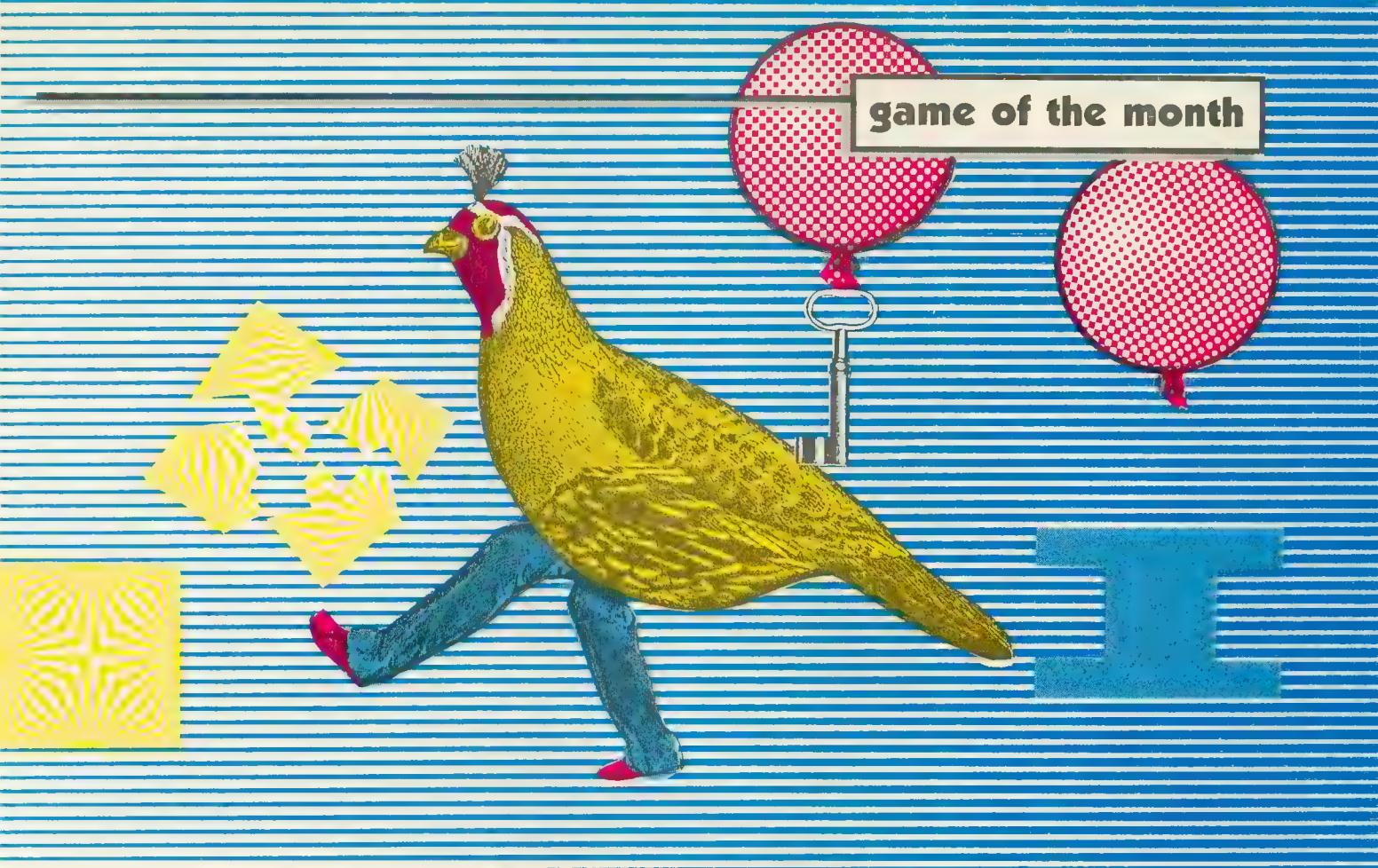
Type in the Q.T. listing, check it with TYPO II, SAVE a back-up copy and RUN the game. Your screen will go blank for about 10 seconds and then display the title screen. Press the joystick button to start. And be sure to press [RESET] before re-running the game.

Brian McWilliams is 17 and a senior at Alpena High School in Michigan, where he's able to take quite a few computer classes. He's currently working on an action game called "Droids."

Q.T. PROGRAM TAKE-APART

10	Dimension variables
20	Get high score
50-90	Title page
100-160	Main module
200-650	1st board

game of the month



800-1030	2nd board	MOVES	Holds ML subroutine for moving the character set	INSET	to fall or item attached to balloon
1050-1630	3rd board				Internal character code for character to be changed
1600-1630	Death routine on 3rd board	A	Reads stick position, loop variable, and other various uses	IP	Object or balloon
1640-1710	Q.T. introduces new bonus item		Loop variable and other various uses	IV	X-position
1800-1840	"You Win!" routine	B,X,Y	Bird color	JUNK	Item value
7000-7310	Subroutines		Bonus item color	LIVES	Variable used for USR call
7020	Erase screen	BC	Bonus item counter	LL,LR,UL,UR	Number of lives left
7100	Display score	BI	Balloon color	NH	Checks corners on first board
7110-7120	Display lives	BIC	Balloon Y-position	NM	Number of objects caught
7130	Display time	BLL	Bonus accumulator	O	Number of objects missed
7190-7260	Death routine	BLLY	Board counter	OFF	Used instead of "0"
7270	Poke high score into memory	BONUS	Used to check an object's path for obstacles	SCORE	Used instead of "0"
7300-7310	Takes care of timer	BRD	Use instead of "1"	TIME	Used instead of "7290"
10000-10060	Changes character set	C	Check corner blocks' path for obstacles	XP	Current score
10070-10075	Data for USR call	C1	Reads Data for new character set	XX	Time remaining
10080-10180	Character set Data	CC	Falling rate and rising rate for objects or balloons	YP	X-position of Q.T.
		CHANGE	Holds high score	Z	Loop variable
		FR	Item color for object		Y-position of Q.T.
		HI			Value of bonus item
		IC			

Q.T. VARIABLE LIST

A\$ Holds value of high score before POKEing it into memory

HI Holds high score

Z

Value of bonus item

A

Listing on page 54.

FINALLY, ANTIC FULL STRENGTH!

MAGAZINE + DISK

NO MORE TYPING long, complex listings.

Now . . . you can IMMEDIATELY start using all the great programs in your copy of Antic every month.

New **ANTIC DISK SUBSCRIPTION:** 12 issues of the best-selling Atari magazine—each with a high-quality disk containing every software listing in the issue

READY TO RUN!



Save \$55! Send us the subscription card with your payment of \$99.95 now—for a big 37% discount off the \$12.95 newstand price. For convenient billing to your Visa or Mastercard, just phone toll-free 800-227-1617 (in California 800-772-3545).

MONEY-BACK GUARANTEE: YOU CAN'T LOSE!

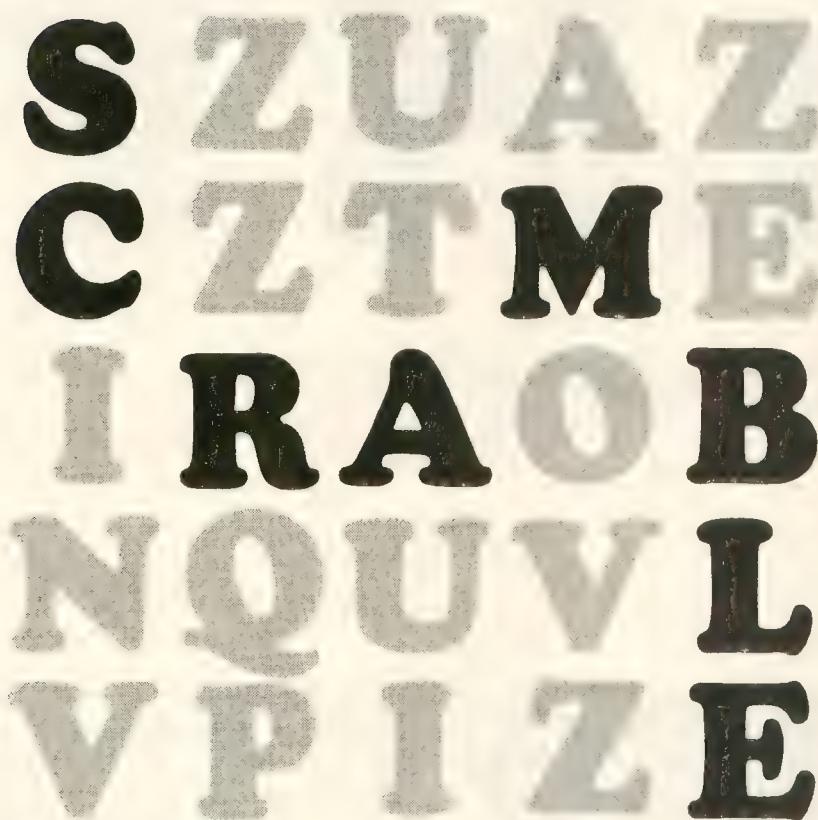
**FULL MEGABYTE DISK
LIBRARY OF ANTIC SOFTWARE!**

A computerized, competitive version of the familiar word finding puzzles. The BASIC program runs on all Atari computers of any memory configuration. *Antic Disk* subscribers RUN "D:SCRAMBLE.BAS".

Scramble is a one-or-two player word game designed to develop vocabulary and spelling skills in a way that's entertaining for all ages. A five-by-five grid of letters is presented to each player. The object is to form words by connecting *adjacent* letters together. The longer the word, the more points you receive. The number of points

letter, mark it, and so on until the word has been spelled out completely. Then position the cursor over any one of these marked letters and press the fire button again to enter the word into a string array, from which your score will later be tallied.

Remember, the letters in the sequence must be adjacent (vertically, horizontally, or diagonally). For example, in the grid below, "darling" is legal while "ding" is not. "Dared" is illegal since a specific letter may be used only once in each word.



by F. NEIL SIMMS

required to win may be chosen by pressing the SELECT key at the beginning of the game. Words must be between three and ten letters long.

To play, first type in the listing, check it with TYPO, and SAVE an extra copy for safety.

Each player competes simultaneously by manipulating the cursor around each board with his or her joystick (plug the joysticks into ports number 1 and 2). When the cursor is positioned over the first letter of a word you have spotted, press the fire button to mark the letter. Proceed to the next

Z	Z	E	Z	Z
Z	D	R	G	Z
Z	L	A	N	Z
Z	Z	I	Z	Z
Z	Z	Z	Z	Z

If you make a mistake while marking the letters, enter the erroneous word anyway; it will be deleted later when the words are reviewed at the end of the round.

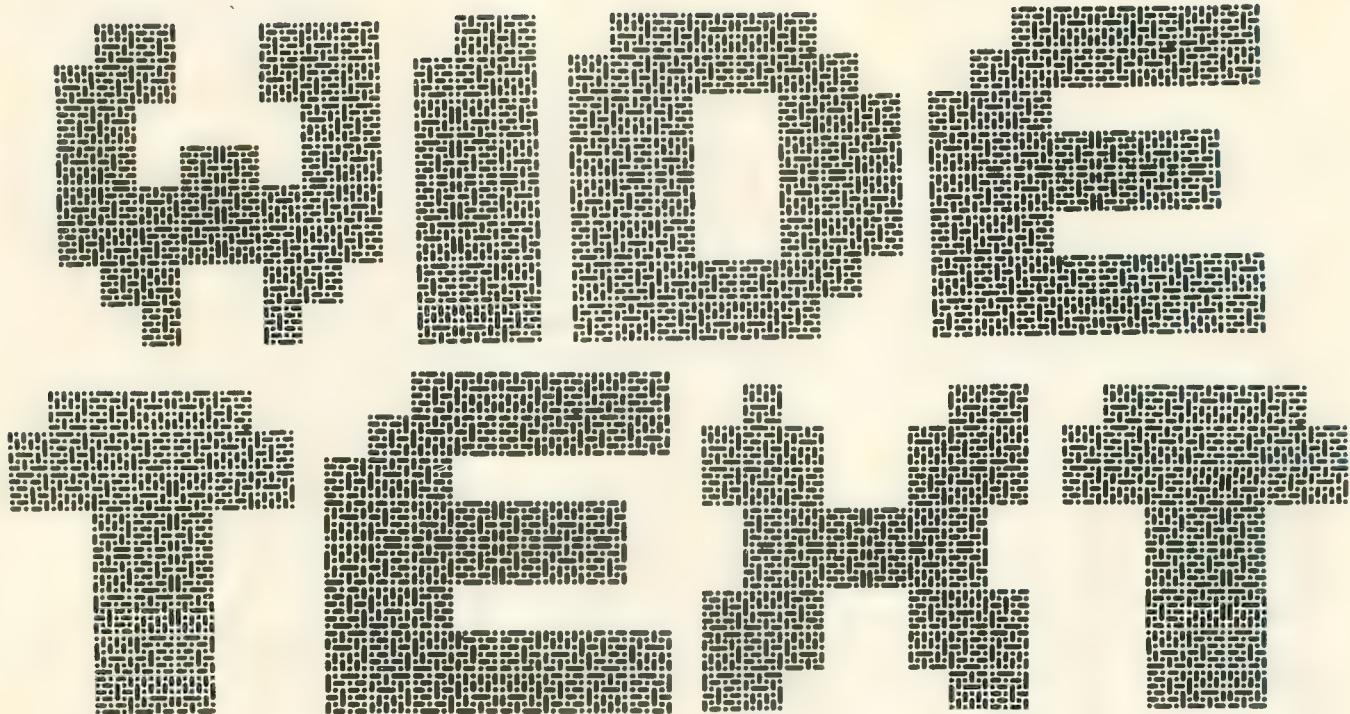
The program surveys each player's set of words and deletes any duplicates. That is, if you enter the word "dog" twice in the same round, the second instance will be disregarded. Any duplicates will be displayed one at a time at the top of the screen, above the appropriate player's board. Press either fire button to pause during the review process.

Each player's words are presented for acceptance or rejection. A dictionary comes in handy here. Press either joystick to the left to accept a word and add its value to the player's score, or to the right to reject a word. After scoring is completed, if the minimum winning value has been reached, a winner is declared. Otherwise a new round is begun.

F. Neil Simms is a graduate student in Computer Science at Union College in Schenectady, New York. He started programming games on his Atari about two years ago, but now concentrates on utilities and graphics programs.



Listing on page 57.



Bold letters beef up graphics 0

by BILL MORRIS

It's been accepted as fact that you have to fold, spindle and mutilate the Atari display list in order to print bold, double-width Graphics 1 letters on a screen in the standard text mode, Graphics 0.

Even after you went through all this programming effort, you still wouldn't be allowed to put Graphics 1 letters on the same line as Graphics 0 letters. And inverse video Graphics 1 letters were completely out of reach.

WideText neatly solves all three problems. It's a short assembly language subroutine that lets you put standard or inverse Graphics 1 letters anywhere on a Graphics 0 screen. And you don't have to struggle with the display list.

You can use the WideText subroutine in your own BASIC or

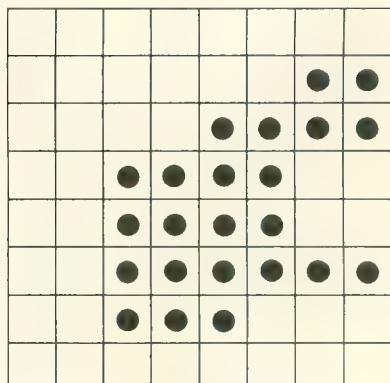
The easiest and most powerful method ever developed for inserting bold double-width Graphics 1 letters anywhere on the screen in Graphics 0, the standard text mode. Works with all Atari computers of any memory size. But if you want to use the included source code, you'll need either Atari Assembler Editor or MAC/65. Antic Disk subscribers, RUN "D:WIDETEXT.BAS"

machine language programs. Antic is publishing WideText here in a longer BASIC demonstration version. The actual subroutine is in binary load format in lines 6400-6520 and 20000-20280. We're also providing the assembly language source code for the subroutine.

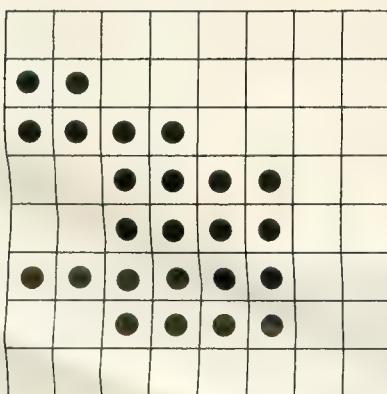
HOW IT WORKS

WideText redefines portions of the computer's character set to simulate the Graphics 1 letters. For example, the letters [CTRL] [A] and [a] have been redefined to look like:

[CTRL] [A]



[a]



Now when [CTRL] [A] and [a] are printed next to each other, they look like an "A" in Graphics 1. It works the same way with any other letter. If you want a Graphics 1 "X," you type [CTRL] [X] and then [x]. WideText only works for letters, not with numbers, punctuation marks, or special characters.

The routine that does this is in lines 20000-20280. You can use it to mix Graphics 0 and Graphics 1 letters in your own BASIC programs. Once included in your program, you can turn it on with the statement X = USR (1536).

You can also type with WideText's simulated Graphics 1 letters. First, set the variable WIDE equal to [1]. Now as you're typing, the routine in lines 6400-6520 substitutes the wider Graphics 1 characters on the screen for each Graphics 0 letter. To type with Graphics 0 letters, set WIDE to [0].

HOW TO USE WIDETEXT

Type in Listing 1, check it with TYPO II, and SAVE a backup copy. When you type RUN, the program will cycle through a demonstration of how WideText prints messages on the screen. You don't need to type either Listing 2 or Listing 3 in order to use Listing 1.

USING ASSEMBLY LANGUAGE WIDETEXT

Listing 2 is the WideText assembly language source code. To use it you need either an Atari Assembler Editor or O.S.S. MAC/65 cartridge. SAVE a

backup copy after you type it in. Antic Disk subscribers, ENTER #D:WIDETEXT.ASM

Once a machine language program is assembled and you SAVE it as object code, it can become part of a BASIC program if it starts with a PLA instruction and ends with an RTS instruction.

Before BASIC can use object code, the code must be converted into DATA statements. Listing 3 will load the converted object code by POKEing this data into memory.

First, save the assembled machine code on a disk by typing SAVE #DPAGE6.OBJ<600,6FF

MAC/65 owners, type:

ASM,,#D:PAGE6.OBJ

If you wish to save the source code too, type:

LIST #D:WIDETEXT.ASM

Next, turn off the computer. Then reboot it with BASIC DOS. Use option L to load the machine-language routine into Page Six.

Exit DOS and use Listing 3, the PEEKER program, to generate the necessary DATA statements. Type in Listing 3, check it with TYPO II and SAVE a backup copy before you RUN it. Antic Disk subscribers, follow the applicable instructions above *before* using the DATA statements it generates.

IMPORTANT: Remember to delete the PEEKER program before using the DATA statements it generates.

Listing on page 59.

ASSEMBLY LANGUAGE TAKE-APART

This take-apart is for Listing 2, the assembly language source code of the DATA statements in Listing 1.

130-190 Sets the variables. Page Zero locations must be chosen carefully, since few are safe from BASIC.

200 Holds the starting address.

210 The PLA at the beginning of a machine-language subroutine exposes the Return-To-Basic address

on the 6502 stack.

220-370 Finds a 1K block of memory just below the bottom of screen memory and copies a slightly modified version of the ROM character set.

410-420 Stores unchanged copies of numerals and punctuation marks.

430-440 Stores unchanged versions of capital letters.

450 Uses the variable ONECHAR to store an extra copy of each value.

460-500 Shifts all bits in ONECHAR four places to the right, and stores the value in HALFCHAR.

510-520 Delete the leftmost four bits of ONECHAR.

530-540 Calls a subroutine that expands four-place bit patterns into eight-place bit patterns. Then, this new byte is stored as a control character. Eight of these bytes will form the right half of a wide letter.

550-580 Deletes the leftmost four bits of HALFCHAR, stretches the patterns to eight bits, and stores this new byte as a lower case letter. Eight of these bytes will form the left half of a wide letter.

590-620 Repeats character-redefining steps 208 times until we have a new alphabet. (26 letters x 8 bytes per letter = 208.)

630-730 Finishes copying and storing the character set.

740-750 Updates the character base pointer, 756 (\$02F4).

760 Contains the "Return from Subroutine" (RTS) instruction.

Bill Morris is a San Francisco taxi driver. He just walked into Antic one day with the WideText program. He also showed us his outstanding almost-finished machine language action game called Taxicab Hill.

Touch Tablet

Here is an idea whose time has come. Touch tablets are the best off-keyboard controller devices.

Various computer magazines have recently pointed out that the touch tablet is a lot easier and more natural to handle than the joystick, paddle, track-ball, custom keypad—or even those highly-touted and expensive newcomers, the mouse and the touch-screen. And just as Antic went to press, Koala Technologies Corp. unveiled an over \$150 KoalaPad business applications controller for the higher-priced microcomputers.

This program lets you use the same principle with your Atari. You can incorporate Touch Tablet Controller into any BASIC program where the user must point to specific places on the screen. There's no reason why your KoalaPad or Atari Touch Tablet must be limited exclusively to graphics input.

Your computer "sees" the tablet as a pair of game paddles. The position of the stylus on the tablet's flat surface is defined by horizontal and vertical coordinates. The horizontal coordinate is read as PADDLE(0) and the vertical coordinate as PADDLE(1).

Similarly, the two touch tablet buttons are treated as game paddle trigger 0 (left button) and 1 (right button). Touch tablet buttons can also be read with the STICK(0) function as follows:

Control the cursor in your own BASIC programs with a KoalaPad or Atari Touch Tablet. Perfect for selecting menu options or educational quiz answers. The program works on all Atari computers of any memory size. Antic Disk subscribers, RUN "D:KOALA.BAS"

STICK(0) = 15 No buttons pressed
= 11 Left tablet button
= 7 Right tablet button
= 3 Both tablet buttons
= 14 Touch Tablet Stylus
= 10 Stylus + left button
= 6 Stylus + right button
= 2 Stylus + both buttons

Unlike joysticks or game paddles, touch tablets can get from point A to point B while skipping all points in-between—not unlike a disk drive. We'll use this feature to create a tablet-controlled cursor. We'll also demonstrate how to use this cursor to choose options from menus and select answers in educational quizzes.

After you have used Touch Tablet Controller for a while, you'll probably think of other applications it can be adapted for. Please write to Antic about your discoveries, so other readers can share them.

USING THE PROGRAM

Type in the program, check it with TYPO II and SAVE a backup copy.

If you are using an Atari Touch Tablet: At the start of line 70 you must [DELETE] 70 REM (which will give you a substituted line 60). Also, in line 40 change 1593 to 1596. Press [RETURN] after making each of these changes.

Now plug your KoalaPad or Atari Touch Tablet into joystick port 1 and type RUN.

There is a brief delay while the program starts. You will see a menu display with four options. Press the stylus against the touch tablet and a diagonal arrow appears on the screen. The arrow's color continuously pulses and changes.

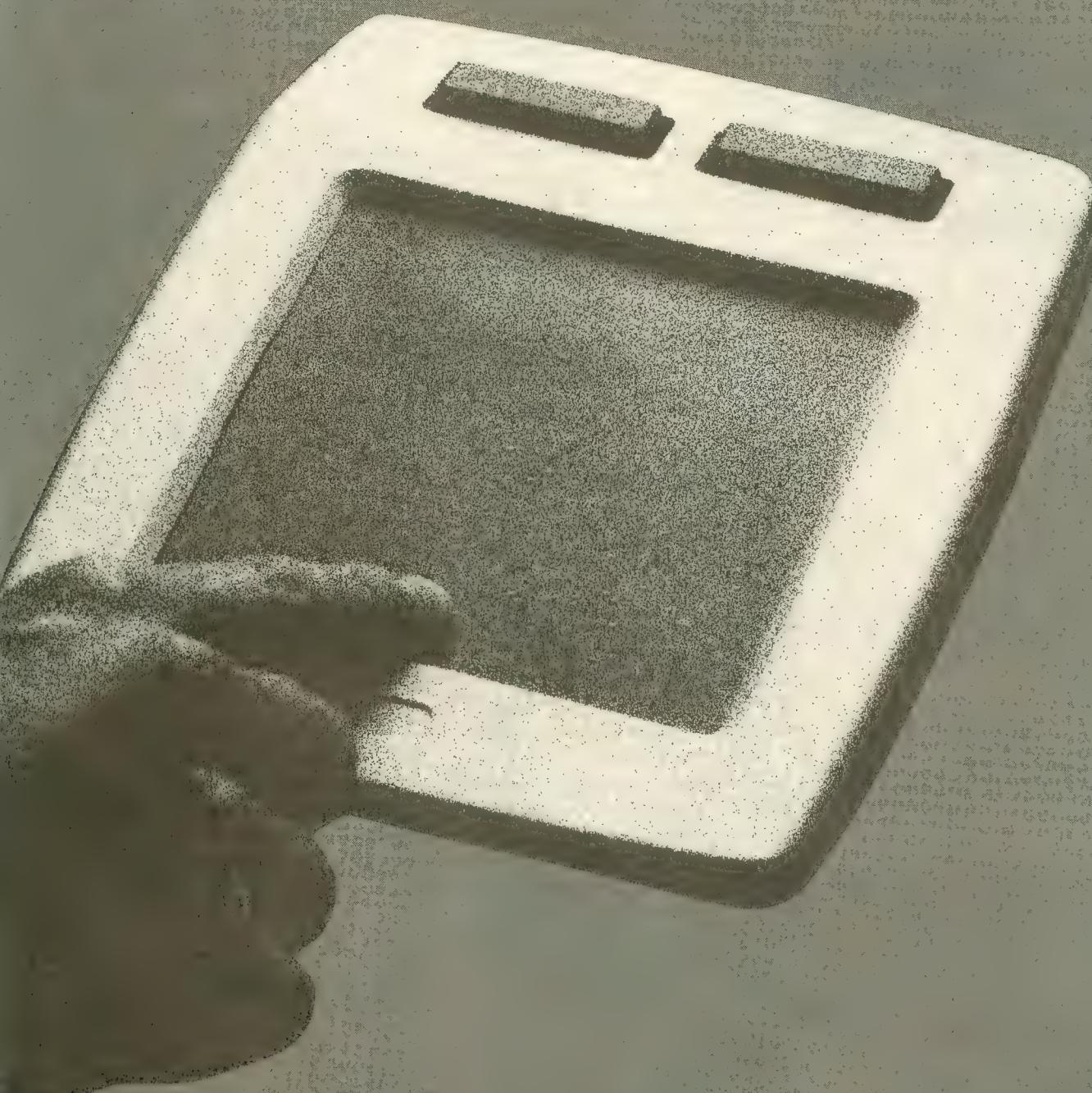
This arrow is your cursor. You can move the cursor around the

continued on page 32



Cursor

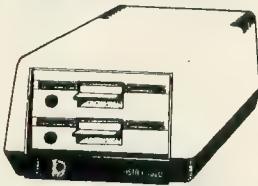
by KARL WIEGERS



Mightier than a mouse!

GREAT VALUES

ASTRA 1620 ...



LIMITED QUANTITIES

\$399.00

PLUS \$10.00 SHIPPING

INCLUDED ...
HOMEWRITER
SMARTDOS
AT NO EXTRA CHARGE

ASTRA 2001 \$595.00

SMARTDOS \$39.00

- SMARTDOS is 100% density smart. SMARTDOS will sense the density of each disk in use and automatically reconfigure the entire system to that density.
- SMARTDOS does not require that a "system disk" has to remain in the drive, or be continually inserted and removed in order to use the DUP.SYS commands.
- With SMARTDOS you may Copy with query, (eliminates specifying each item individually).
- Counter screens - which keeps the user informed as to what the system is doing and where in the task the system is.
- Disk testing for bad or unusual sectors that may be corrected.
- RESIDUP feature allows simple yet powerful full time availability of DUP.SYS commands while leaving your program intact and ready to RUN.
- Minimum keystrokes for maximum power, e.g. a disk directory is done by pressing only one key - the drive number (great for filesearches), and "=" may be used to replace "*".
- The ability to run from 1 to 9 autorun files sequentially.
- Built in disk drive speed check.
- SMARTDOS is only 34 single density sectors long and works with all Atari computers with a minimum of 24K RAM.

FILING SYSTEM \$39.00

FILING SYSTEM allows the user to configure any type of data file imaginable. Examples are recipe cards, mail lists, reminders for birthdays, checkups, etc..., complete inventories (home and business), personnel files, customer call-ups, price list, and much, much more. You may retrieve data using any field or combination of fields. Files also may be saved, sorted, and printed in a preset format that you configure. Uses either a single or a double density disk drive. 24K minimum.

(ORDERS ONLY)

MasterCard/VISA

The Programmers Workshop

5230 Clark Ave., Suite 19
Lakewood, CA 90712

100 ITEM CATALOGUE

TOUCH TABLET CURSOR

continued from page 36

screen by sliding the stylus on the touch tablet. Lift the stylus and the cursor disappears.

The cursor will not be visible when the stylus is near the left or right edges of the tablet. This happens because most TV sets are only able to display horizontal coordinate values between 48 and 210.

Point the arrow toward one of the menu items and press a touch tablet button. You'll see a display telling you that your selection was accepted and the program branched properly. Menu option two shows how to use the touch tablet to select answers to questions printed on the screen. Press any touch tablet button to return to the main menu.

This example illustrates how easily a touch tablet can be used to indicate screen positions and accept input from the user.

HOW THE PROGRAM WORKS

In BASIC, paddles 0 and 1 are read by PEEKing memory locations 624 and 625. The range of possible values for horizontal and vertical coordinates on the KoalaPad are 3 (extreme left or top) through 228 (extreme right or bottom). For the Atari Touch Tablet it's 9 (extreme left or bottom) and 228 (extreme right or top). If the stylus is not pressed against the tablet, the default paddle values are 3 for the KoalaPad, and 228 for the Touch Tablet.

The arrow cursor is set up as player 0, using single line resolution. A vertical blank interrupt (VBI) machine language routine is used to read the position of the stylus and set the horizontal and vertical positions of the cursor. The VBI also changes the color of the player 15 times per second to create the pulsing effect. Using a VBI like this allows the touch tablet to be read frequently without interfering with the rest of the BASIC program. The VBI

routine is turned on in line 370 with the statement A = USR(1536), and can be turned off with A = USR(AD).

Lines 260-310 set up a simple menu in Graphics 1. Line 400 loops until one of the touch tablet buttons is pressed. Lines 420-450 evaluate the vertical position of the stylus (PEEK(205)) and branch to appropriate routines for the different menu options. The button is ignored if the cursor is not pointing at one of the available options (line 460).

Options one and three show a screen display and wait for a button press to return to the menu (lines 470-520 and 680-730). The VBI is turned off when reaching these displays, so you won't see the arrow.

Option two poses a simple addition question and lets the user select an answer with the stylus and button. Line 590 evaluates the vertical coordinate of the cursor, and line 600 judges the horizontal coordinate. The empty FOR-NEXT loops keep the computer from reading the touch tablet button too rapidly.

The QUIT option in the menu goes to an exit routine at lines 740-760. This removes the cursor from the screen and turns off the VBI.

Karl Wiegers is a Ph.D. research chemist for Kodak in Rochester, NY. He's also a regular Antic author, specializing in graphics applications.

MANUFACTURERS

ATARI TOUCH TABLET

Atari Corp.

1265 Borregas Avenue
Sunnyvale, CA 94086
(408) 745-2000
\$89.95, 32K-cartridge

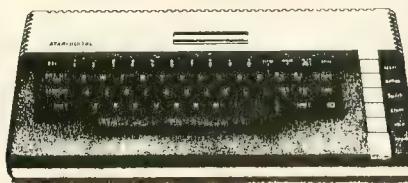
KOALAPAD

Koala Technologies Corp.
3100 Patrick Henry Drive
Santa Clara, CA 95050
(408) 986-8866

\$125, 32K-cartridge, 48K-disk 

Listing on page 61.

Always the Lowest Prices on the Finest Quality at... COMPUTER CREATIONS



**OKIMATE
10 COLOR PRINTER
\$139⁹⁵**

With purchase of printer interface!!

ATARI HARDWARE

Atari 800XL™ Home Computer (64K RAM)	CALL FOR UPDATED PRICES
Atari 410 Recorder (Special)	
Atari 1010™ Program Recorder	
Atari 1020™ 40-Column Color Printer/Plotter	
Atari 1025™ 80-Column Printer	
Atari 1027™ Letter Quality Printer	
Atari 1030™ Direct Connect Modem	
Atari 1050™ Disk Drive	
CX77 Atari Touch Tablet™	
Atari Light Pen	

*Screen Dump Program **FREE!!** with purchase of CX77

DISK DRIVES

Indus GT (Free Software)	CALL FOR UPDATED PRICES
Astra 1620	
ATR-8000	
Happy Enhancement for Atari 810 and 1050 Drives	

SUPER SOFTWARE PRICES

Atari
Electronic Arts
EPYX
American Educational
Infocom
Syn-Series
Spinnaker
OSS
LJK
Others

DISKETTE/CARTRIDGE/ CASSETTE FILES	
Flip 'N' File 10	3.95
Flip 'N' File 15	6.95
Data Defender	16.99
Flip 'N' File/The Original	16.95
Disk Bank	3.99
Colored Library Case	2.99
Disk Bank/5 (holds 50)	12.99
Power Strip (6 outlet)	16.95
Lineguard Spike Suppressor	13.99
Disk Drive Cleaning Kit	11.99
Ring King Wallet (holds 10 disks)	4.99
Ring King Wallet (holds 20 disks)	7.99

AUTHORIZED SERVICE CENTER

ATARI

STAR MICRONICS (GEMINI)

Call for prices and services.

GENERIC DISKS AT FANTASTIC PRICES!!

GENERIC DISKS AS LOW AS 99¢ ea.

Generic 100% Defect-Free/Guaranteed.

Includes sleeves, labels, write protect tabs, reinforced hub rings, lifetime warranty.

	DISKETTES	1 or 2 boxes	SS/SD	SS/DD	DS/DD
(1 box minimum)		11.50	13.50	16.50	
10 per box		9.90	11.99	14.99	

PRINTERS

GEMINI 10X (80 Column)	259.00
GEMINI 15X (136 Column)	379.00
DELTA 10 (80 Column)	360.00
RADIX 10 (80 Column)	539.00
RADIX 15 (136 Column)	649.00
POWERTYPE Daisywheel	339.00
EPSON RX-80 (80 Column)	279.00
EPSON RX-80 FT (80 Column)	359.00
EPSON FX-80 (80 Column)	429.00
OKIDATA 92P	449.00
EPSON RX 100 (135 Column)	459.00
TTX LETTER Quality Printer (Includes Tractor Feed)	359.00

Printer Interface Cables

MPP-Micropoint	49.95
MPP-1150 Parallel Printer Interface	59.95

Printer Ribbons

GEMINI Printers (Black/Blue/Red/Purple)	3.00
EPSON Printers	8.95

RAM (Memory) BOARDS

Microbits 64K (600XL) Expansion	89.95
---------------------------------------	-------

MONITORS

Sakata SC 100 Color Screen	239.00
Monitor Cable	4.95
Sanyo 12" Green Screen	84.95
Sanyo 12" Amber Screen	89.95
Sanyo Color Screen	229.95
Sanyo 9" Green Screen	69.96

MODEMS

MPP-1000C Modem	114.95
Signalman Mark XII Modem with R-Verter	299.95
Mark X with R-Verter	169.95

To order call TOLL FREE
1-800-824-7506
ORDER LINE ONLY

COMPUTER CREATIONS, Inc.

P.O. Box 292467 - Dayton, Ohio 45429

For information call: (513) 294-2002 (Or to order in Ohio)

Order Lines Open 8:30 a.m. to 8:00 p.m. Mon.-Fri.; 10:00 a.m. to 4:00 p.m. Sat. (Eastern Standard Time). Minimum \$10 per order. C.O.D. add \$2.50. All prices are subject to change without notice. Call toll free number to verify prices and availability of product. Actual freight will be charged on all hardware. Software and accessories add \$3.50 shipping and handling in Continental United States. Actual freight will be charged outside U.S. to include Canada, Alaska, Hawaii, Puerto Rico. Ohio residents add 6% sales tax. NO CREDITS! Return must have authorization number.



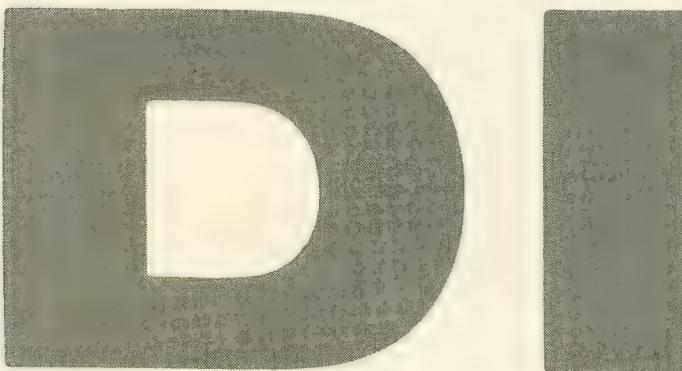
DISKIO is a superb enhancement for DOS 2.0S. For openers, it provides access to nearly all the DOS functions directly from BASIC or Atari Assembler Editor. It also has an alphabetical disk directory display and needs only a few keystrokes for disk file operations. DISKIO works on any Atari computer with one or more disk drives. Antic Disk subscribers, RUN "D:DISKIO.BAS".

The day DISKIO arrived at Antic it became our in-house disk utility. It's that good!

DISKIO is a disk operations program that resides safely in memory and provides access to nearly all of the functions of DOS 2.0S directly from BASIC or from the Atari Assembler Editor cartridge. A number of similar "miniDOS" programs have appeared in various articles, but DISKIO removes the need for DUP.SYS more completely than any of these.

Moreover, DISKIO has a number of features that make it outstandingly easy to use, such as a two-column listing of the disk directory that is *alphabetized* and numbered, shortened commands that use those numbers, and a HELP menu that makes nearly everything self-explanatory.

Incredibly, that's not all! DISKIO also verifies poten-



tially destructive commands, prevents renaming to an existing name, and is full compatible with the Atari BASIC and Assembly Editor cartridges.

Oh yes... and DISKIO occupies only 3K of memory, that's 25 disk sectors compared with 42 sectors for DUP.SYS. —ANTIC ED

READYING DISKIO

Use a disk containing DOS 2.0S (if the DOS.SYS file is 39 sectors long it should be okay). Type in Listing 1 exactly as it appears. The program is designed to check itself, but if you use the new TYPO II, you'll be able to find typing mistakes right after typing each line. Once you have the program correctly typed in, SAVE a backup copy then RUN it. The message "READY TO CREATE AUTORUN.SYS FILE?" will be displayed. Type [Y] and DISKIO will be created on disk as AUTORUN.SYS.

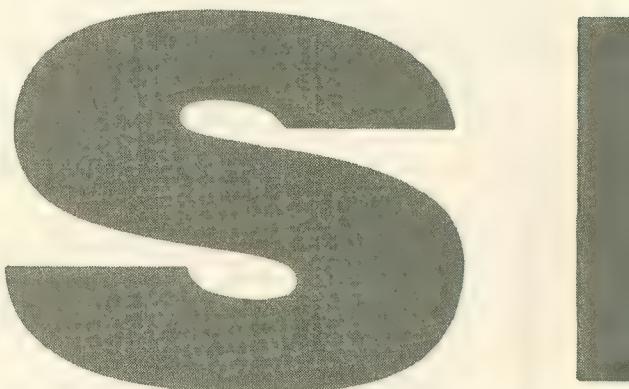
USING DISKIO

Boot your system with the disk containing the new AUTORUN.SYS file you just created, plus either Atari BASIC or Assembly Editor. DISKIO will be loaded into

memory automatically. A message will be displayed indicating that DISKIO is present and suggesting that you type HELP [RETURN] to see the commands. If you do so, the HELP menu will appear on the screen:

DISKIO COMMANDS

DIR	Directory
DIRn	Dir. Drive n
FORMAT	Format disk
WDOS	Write DOS.SYS
.X->LI.->	LISTD List to disk
.S->S. ->	SAVE Save to disk
.E->E. ->	ENTER Enter to mem.
.L->LO.->	LOAD Load to mem.
.R->	RUND Run disk file
.K->	LOCK Lock file
.U->UN.->	UNLOCK Unlock file
.N->RE.->	RENAME Rename file
.D->DEL.->	DELETE Delete file
.B->BL.->	BLOAD Binary load
.M->M. ->	MOVE Move file
.R9 runs #9 etc.	To use DOS type KILL. Reboot to restore DISKIO.



The first column of the HELP menu lists the abbreviated .C commands which allow files to be designated by number rather than by name. The second column lists the abbreviated forms of the commands, the third lists the full command names, and the fourth gives a brief definition. Type DIR [RETURN] and the disk directory will be displayed in a manner similar to the one below:

SAMPLE DISKIO DIRECTORY

1 ASMSRCH OBJ 002	8*DUP	SYS 042
2 ASMSRCH SRC 028	9 HMSG	SRC 010
3* AUTORUN SYS 025	10 RNMCHK	SRC 021
4* DISKIO OBJ 025	11 RTNLNTX	SRC 004
5* DISKIOC SRC 168	12 SCRSRT	SRC 051
6* DISKIOZ SRC 175	117 FREE SECTORS	
7* DOS SYS 039		

Notice that the directory is displayed in two columns, with the file names alphabetized and numbered. Up to 41 file names can be displayed simultaneously.

The DIRn command is discussed in the "Two Disk

Drives" section. The FORMAT command will format your disk after two safety prompts. The WDOS command will write DOS.SYS to the disk, but not DUP.SYS. The latter can be copied from another disk using the MOVE command (see below).

The .C commands (column 1 of the HELP menu) consist of a period, the command letter, and the file number. To use these commands the file name must be up on the screen as a result of a previous DIR command. For example, if 12*MYFILE.SAV is displayed, instead of typing RUN"D1:MYFILE.SAV [RETURN], all you have to type is .R12 [RETURN]. You can rename a file by entering the following sequence of commands: .N12,NEWFILE.SAV [RETURN] [Y]. The [Y] is there

because you are asked to verify all .C commands that might destroy data on the disk. To lock NEWFILE.SAV you would type DIR and then a .K command with the new file number.

Columns 2 and 3 of the HELP menu show the abbreviations:

KI

I



iated and full commands which will require file names as part of the command. Unlike BASIC, the quotes and device designation are optional so that E.MYPROG is the same as ENTER "D: MYPROG" (or ENTER#D: MYPROG for ASM/ED users).

These commands are handy when using wildcards to manipulate more than one file: LOCK *.*. Keep in mind that with the exception of FORMAT, there is no safety prompt with these commands. If you type DEL.MYFILE, MYFILE will be deleted.

The RENAME command will not permit you to use the same name as an existing file (you know what havoc that causes!). The BLOAD command will recognize the /N suffix (even in the .C form, like .B10/N) to bypass the initialization and run steps in the binary load process.

The MOVE command functions like the Duplicate File option in the DOS menu. The file is copied into memory, then the system pauses and the message INSERT DISK2;

Supercharger for Atari DOS

by DR. BERNARD E. OPPENHIEM

continued on next page

HIT ANY KEY (S=SCREEN) is displayed. If you type [S], the file will scroll up the screen. The scrolling can be halted and resumed by entering [CTRL] [I]. If you hit any other key the file is written back to the disk under the original file name. The only limitation here is that the file must fit into the available free RAM, or else the message "OUT OF RAM" will appear and the operation will be terminated. For 48K systems a file up to 233 sectors long can be moved when there is no program in memory.

To use DUP.SYS (via the DOS command) you must first remove DISKIO by typing KILL [RETURN]. To restore DISKIO the system must be rebooted. If the system is booted with no cartridge, DISKIO will return control to DOS and the DUP.SYS menu will appear. It should be noted that all DISKIO commands are active only at the READY level to keep DISKIO from interfering with user programs (think what trouble the KILL command would cause in an adventure game).

TWO DISK DRIVES

All DISKIO commands can be used with two disk drives. The command DIRn will display the directory for Drive n, for n=1, 2, 3, or 4. Furthermore, this command causes Drive n to become the default drive for all situations in which the drive number is not specified. For example, upon typing DIR2 [RETURN] the directory for Drive 2 is displayed, and a subsequent .C command will refer to

files on that drive. FORMAT will format the disk in Drive 2 and WDOS will write DOS.SYS to it.

When using the MOVE command with two drives, only the files in drive 1 can be copied to the screen, and drive 1 files can only be moved to drive 1. However, when the directory for drive 2 is displayed, the MOVE command will automatically copy the designated file into memory, then immediately move it to drive 1 under the original file name.

FOR ADVANCED USERS

DISKIO is located between \$1CFC and \$2934, and protects itself by moving up MEMLO. It revectorizes the screen editor's GET BYTE routine, allowing it to compare all entries with a list of commands in a jump table. If a match is found the appropriate command is executed. Otherwise the entry is returned to the screen editor. DISKIO reinitializes itself upon [RESET].

DISKIO should not conflict with the user's program unless the latter overwrites DISKIO's reserved memory or moves MEMLO into it. All permanent storage is within the reserved memory, and LBUFF is used for temporary storage. Page One is used only for stack functions and page Six is not used. Page Zero is not altered since existing values are saved in the stack upon entering DISKIO and restored upon exiting.

The DISKIO AUTORUN.SYS file can be concatenated with other AUTORUN.SYS files which do not conflict with it. DISKIO should probably be the first segment in the chain to make it reset-proof.

For users with the Omnimon chip, the MOVE command can be used to modify disk files in Drive 1. After copying the file into memory the system pauses to allow the user to change disks. At this point Omnimon can be invoked, the file can be modified in memory, and then can be written back to disk with these keystrokes: [START] [RETURN] to exit Omnimon, [RETURN] to write the file back to disk, and [RESET] to restore some vectors.

Bernard E. Oppenheim is a nuclear medicine physician in Indianapolis. He has been programming in FORTRAN on large computers for 15 years and began programming the Atari in assembler two years ago. Dr. Oppenheim has contributed DISKIO to the public domain as of February, 1985 and Antic is pleased to introduce this important utility to the Atari users community.



Listing on page 62.

Put a Monkey Wrench into your ATARI 800 or XL

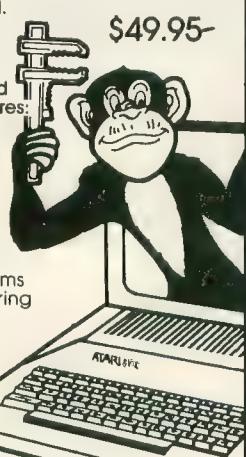
Cut your programming time from hours to seconds, and have 33 direct mode commands and functions. All at your finger tips and all made easy by the MONKEY WRENCH II.

The MONKEY WRENCH II plugs easily into the cartridge slot of your ATARI and works with the ATARI BASIC.

Order your MONKEY WRENCH II today and enjoy the conveniences of these 33 features:

- Line numbering
- Renumbering basic line numbers
- Deletion of line numbers
- Variable and current value display
- Location of every string occurrence
- String exchange
- Move lines
- Copy lines
- Up and down scrolling of basic programs
- Special line formats and page numbering
- Disk directory display
- Margins change
- Home key functions
- Cursor exchange
- Upper case lock
- Hex conversion
- Decimal conversion
- Machine language monitor
- DOS functions
- Function keys

The MONKEY WRENCH II also contains a machine language monitor with 16 commands that can be used to interact with the powerful features of the 6502 microprocessor.



\$49.95

MAE

An easy to use but powerful Macro Assembler/Editor. Includes M.L. Monitor, Word Processor and more. **The Best for Less!**
Now Only \$59.95.
(For use with ATARI 800 or XL and Disk Drive.)

Eastern House

3239 Linda Dr.
Winston-Salem, N.C. 27106
(919) 748-8440

MAXIMIZE STORAGE CAPACITY ON YOUR ATARI 1050* DISK DRIVE WITH THE HAPPY 1050 MAXIMIZER™

Now you can store twice as much data on your ATARI 1050 disk drive with this easy to install high quality plug in adapter. Requires no soldering and no permanent modifications. Runs all popular true double density programs, utilities, and operating systems.



You can upgrade your HAPPY 1050 MAXIMIZER to a **WARP SPEED HAPPY 1050 ENHANCEMENT™**. Improves reading and writing speed 500% and comes with the **HAPPY COMPUTERS WARP SPEED SOFTWARE™** package. Makes your ATARI 1050 the most powerful disk drive available. Easy plug in installation lets you upgrade your HAPPY 1050 MAXIMIZER to **WARP SPEED** at any time.

Take COMMAND with the HAPPY 1050 CONTROLLER™

When used with the **ENHANCEMENT** or **MAXIMIZER** allows writing on the flip side of disks without punching holes. Selects protection from writing on valuable disks. Selection can be made both from software commands and a three position switch. When used with the **ENHANCEMENT** allows both switch and software control of reading and writing speeds. Plug in installation requires no soldering. May be used without **ENHANCEMENT** or **MAXIMIZER** with manual control of write protection.

Discount prices through Dec. 31, 1984:

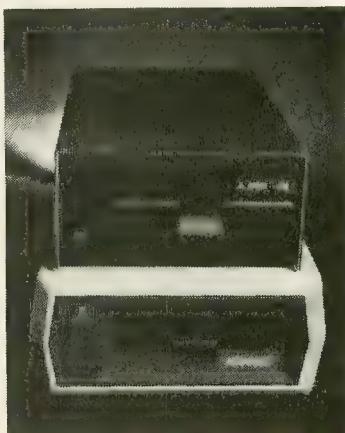
HAPPY 1050 MAXIMIZER complete.....	\$124.95
MAXIMIZER to ENHANCEMENT UPGRADE	\$129.95
(You must already have a Happy 1050 Maximizer)	
HAPPY 1050 MAXIMIZER with factory installed	
MAXIMIZER to ENHANCEMENT upgrade, same as	
WARP SPEED HAPPY 1050 ENHANCEMENT	\$249.95
HAPPY 1050 CONTROLLER.....	\$49.95
WARP SPEED HAPPY 810 ENHANCEMENT*	
for 810 disk drive (supports high speed	
single density).....	\$249.95

Price above include free delivery in the USA.
California residents add 6.5% sales tax.

*Note: ATARI 1050 is a trademark of Atari, Inc.

HAPPY COMPUTERS, INC.
P.O. Box 1268, Morgan Hill, CA 95037
(408) 779-3830

Disk Drives for Your Atari



B&C
810
Atari
810

The **B&C 810** runs more software than any other disk drive made today. All electronics are interchangeable with a standard **Atari 810**. Uses the latest revision analog upgrade. Comes complete ready to plug in with a DOS games demo disk. Available with or without **Happy 810** enhancement.

\$259 B&C 810 **\$449** with Happy

B&C computervisions (408) 554-0666

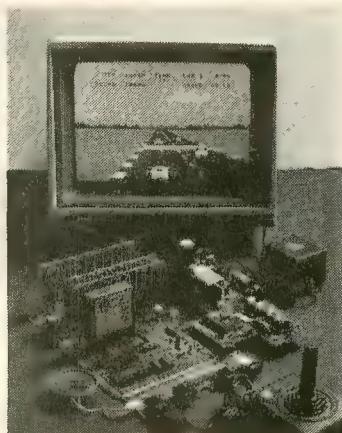
3400 El Camino Real, #1, Santa Clara, CA 95051

Normal Hours: Tuesday-Friday 10am-7pm/Sat. 10am-5pm

Xmas Hours: 7 Days a week

MC & VISA in store only

Terms: UPS Shipments free within USA for orders over \$50. Add \$5 if under \$50. COD or prepaid. Calif. Res. add 6 1/2% sales tax.



Atari 800 spare parts kit: Main, 10K OS REV B,	
CPU w/GTIA, 16K RAM, power board,	
cable, speaker	\$75
less 16K RAM	\$55
GTIA, 6502, 6511, ANTIC, PIA,	
6507, 6532,	\$5 ea.
ROM B chip set	\$10
CPU w/GTIA	\$20
Atari 800 Tech Manual	\$25
Atari 800 or 810 Diagnostic Cart	\$25 ea.

Parts and supplies for Atari

THE PARALLEL BUS REVIEW

100,000 bytes per second

Part one of a four-part series

by EARL RICE

Until now, the Parallel Bus Interface has been one of the big mysteries of Atari XL computers. This important Antic series—by one of Atari's former top technical executives—will at last provide all the information necessary for tapping the power of this 100,000 byte per second connection.

If you own an Atari 600XL or 800XL, you've probably noticed a little plastic cover on the back. Above that cover are the words "PARALLEL BUS." Until now, this port has only been used for memory expansion cartridges.

Then last June at the Consumer Electronics Show, the Atari company finally released full specifications for the Parallel Bus Interface (PBI). This series of articles is based on that information.

In the next few issues of **Antic**, we'll explain how the parallel bus works and how you can use it with your own projects.

IMPORTANCE OF THE PBI

The parallel bus interface runs at the same speed as the 6502 microprocessor—and it can transfer information more than *40 times faster* than the serial connector.

The serial connector can transfer no more than 2400 bytes per second. The parallel bus can easily transfer 100,000 bytes or more per second, depending on software execution speed. This speed allows you to design controllers for hard disks and other high-speed devices.

WHAT THE PBI IS

Basically, the parallel bus connector is an extension of the 6502 data, address, and control signals. These signals aren't buffered, and can drive only a very limited electrical load. Unmodified, there isn't very much you can do with the PBI. When used with

appropriate software and hardware, however, the PBI becomes an extremely powerful extension of your computer.

Fortunately, the PBI's design is easy to understand. Additionally, most of the software you'll need is already in the Operating System. This code, called the Generic Parallel Device Handler, resides at location 58511 (\$E48F), just waiting to talk to your high-speed devices. All you have to do is write the low-level hardware driver software and combine it with your hardware.

But first you need to see how the PBI works.

A parallel device (*Figure 1*) is essentially a circuit board containing five key elements:

- A ROM chip containing both the low-level driver software and a Device Handler Table.
- Any RAM required for on-board buffers.
- Some address-decoding logic.
- A hardware-select register.
- The functional circuitry itself. (Perhaps an I/O device such as a universal asynchronous receiver/transmitter (UART) to drive a modem, or a parallel interface adapter (PIA) to drive a printer.)

All device registers, ROM, and RAM are mapped into your computer's memory space as shown in the simplified memory map (*Figure 2*).

The PBI's ROM space is mapped into the same area as the OS conversion routines from ASCII to Floating Point. The computer's memory management IC switches out the OS ROM when an external device is selected, and switches back in when it's done. The catch is that your external device can't use the floating point software in the OS. It also can't use any function of the OS or application software

continued on next page

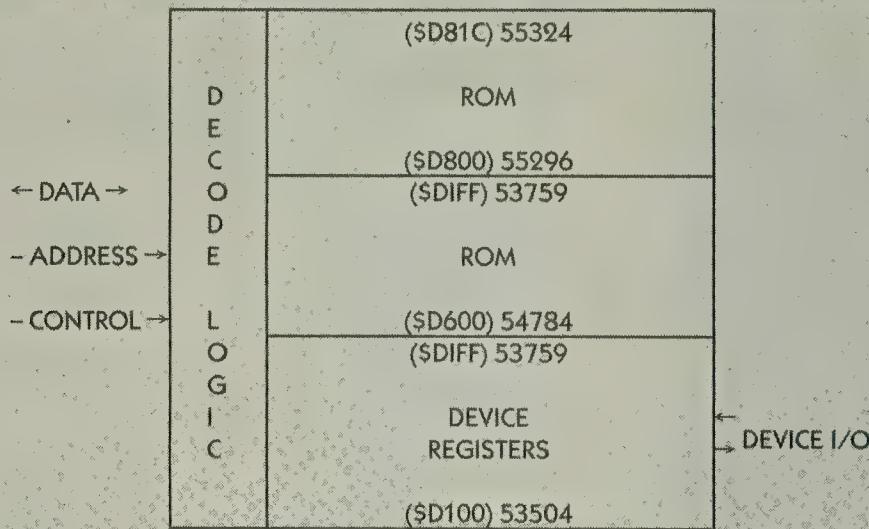


Figure 1.
Parallel Device Block Diagram

(like BASIC) that uses floating point routines.

Since most external devices are essentially I/O peripherals, these restrictions should not create many programming problems.

The first 26 bytes of ROM contain a data table (*Figure 3*). This is a handler table which has the same format as the other OS vector tables. Note that some of the data is optional. The required data consists of ID bytes used by the Generic Handler to validate the presence of a parallel device, and JUMP vectors to device functions.

During a coldstart, just before at-

tempting to initialize a cartridge, the OS will poll for parallel devices. If the ID bytes are correct, the OS will execute the JMP to the INIT routine at 55321 (\$D819) through 55323 (\$D81B). This routine must put the address of the Generic Handler (58511, or \$E48F) into the OS handler table (HATABS) along with the device name (T, for example).

That done, your routine sets its select bit in the Device Mask, performs any device-specific initializations and ends with an RTS instruction.

That's really all it takes to let the OS "talk" to your device. Of course, there

are the low-level device drivers to consider, but we'll examine them in a later article. For now, remember that the OS simply needs to know that your device exists (have its bit set in the Device Mask) and to have the Generic Handler's address in HATABS (*Figure 4*).

The OS can handle up to eight devices on the PBI. The OS selects a device by setting the appropriate bit in the Hardware Select register, located at 53759 (\$D1FF). BIT 0 selects DEVICE 0, BIT 1 selects DEVICE 1, and so on.

Just like the other registers in the computer, this one has a shadow loca-

	ADDRESS	OS	DEVICE
58511	\$E48F	GENERIC HANDLER	
55324	\$D81C	FLOATING PONT ROUTINES	2K ROM
55296	\$D800		
55295	\$D7FF		RAM
54784	\$D600		
53759	\$D1FF		SELECT REGISTER
53758	\$D1FE		DEVICE
53504	\$D100		REGISTERS
584	\$0248	SELECT SHADOW	
583	\$0247	DEVICE MASK	

Figure 2.
Parallel Device Memory Map

\$D800	*ROM CHECK SUM LOW BYTE	\$D80A	INTERRUPT VECTOR HIGH BYTE	SD814	PUT BYTE VECTOR HIGH BYTE
\$D801	*ROM CHECK SUM HIGH BYTE	\$D80B	ID NUMBER (\$91)	\$D815	STATUS VECTOR LOW BYTE -1
\$D802	*ROM REVISION NUMBER	\$D80C	*DEVICE NAME (ASCII)	SD816	STATUS VECTOR HIGH BYTE
\$D803	ID NUMBER (\$80)	\$D80D	OPEN VECTOR LOW BYTE -1	SD817	SPECIAL VECTOR LOW BYTE -1
\$D804	*DEVICE TYPE	\$D80E	OPEN VECTOR HIGH BYTE	SD818	SPECIAL VECTOR HIGH BYTE
\$D805	JMP (\$4C)	\$D80F	CLOSE VECTOR LOW BYTE -1	\$D819	JMP (\$4C)
\$D806	I/O VECTOR LOW BYTE	\$D810	CLOSE VECTOR HIGH BYTE	SD81A	INIT VECTOR LOW BYTE
\$D807	I/O VECTOR HIGH BYTE	\$D811	GET BYTE VECTOR LOW BYTE -1	SD81B	INIT VECTOR HIGH BYTE
\$D808	JMP (\$4C)	\$D812	GET BYTE VECTOR HIGH BYTE	SD81C	*UNUSED
\$D809	INTERRUPT VECTOR LOW BYTE	\$D813	PUT BYTE VECTOR LOW BYTE -1		

*OPTIONAL — NOT REQUIRED

Figure 3.
ROM Vector Table

tion. The computer uses shadow registers to update the values in its hardware registers. These values are updated 30 times per second. The Hardware Select register's shadow location is at 583 (\$0247).

SELECTING DEVICES

Before selecting a device, the OS looks at the Device Mask (location 583, \$0247) to see if such a device really exists. Recall that this was the bit set by the initialization routine.

Parameters are passed between the OS and the device using the A, X and Y registers plus the Page Zero I/O Control Block (IOCB).

The carry flag tells the OS whether or not the device performed its requested function. The device sets the flag when it has performed its function. Otherwise, the carry flag is left RESET (0).

The A register passes a data byte, the X register contains the index to the originating device's IOCB, and the Y register contains a Device Status byte. This is the same as any other Central I/O (CIO) operation.

By the way, this is a good place to mention that Atari's Technical Reference Notes (C016555 Rev. A) are worth their weight in system errors. The basic operation of CIO, IOCB's, Device Status codes and the like are all presented concisely. If you are

continued on page 75

\$031A	'P' (PRINTER NAME)
\$031B	HANDLER LOW BYTE
\$031C	HANDLER HIGH BYTE
\$031D	'C' (CASSETTE NAME)
\$031E	HANDLER LOW BYTE
\$031F	HANDLER HIGH BYTE
\$0320	'E' (EDITOR NAME)
\$0321	HANDLER LOW BYTE
\$0322	HANDLER HIGH BYTE
\$0323	'S' (SCREEN NAME)
\$0324	HANDLER LOW BYTE
\$0325	HANDLER HIGH BYTE
\$0326	'K' (KEYBOARD NAME)
\$0327	HANDLER LOW BYTE
\$0328	HANDLER HIGH BYTE
\$0329	0 (T) ←
\$032A	0 (\$8F) ←
\$032B	0 (\$E4)
\$032C	0 (NAME SLOT)
\$032D	0 (VECTOR LOW SLOT)
\$032E	0 (VECTOR HIGH SLOT)
\$032F	0
\$0330	0
\$0331	0
\$0332	0
\$0333	0
\$0334	0
\$0335	0
\$0336	0
\$0337	0
\$0338	0
\$0339	0
\$033A	0
\$033B	0 (ALWAYS 0)

FIND THE FIRST
0 NAME ENTRY, THEN:
PUT DEVICE NAME HERE
PUT GENERIC HANDLER ADDRESS
(\$E48F) HERE

Figure 4.
Putting Your Device In HATABS

Say goodbye to glitchy DOS 3 forever! Convert your files back to good old DOS 2.0S. You'll need three blank disks and your DOS 3 Master Disk. You'll also need the BASIC version of Eric Verheiden's SEQDOS program from "Cassette Lookalike—Your Disk Drive" on page 81 of the July, 1984 Antic.

ESCAPE FROM DOS 3

Your files will thank you

by CHARLES JACKSON
Antic Staff Writer

Many Atari programmers were bitterly disappointed when they tried Atari's newest disk operating system last year. DOS 3 turned out to be flawed, slow and user-hostile.

Users had to correct the original DOS 3 versions with several obscure POKE statements from BASIC. All versions of DOS 3 store your programs in a format that is incompatible with virtually every other disk operating system. DOS 3 keeps each utility in a separate file. These utilities must be individually loaded or copied from the DOS 3 Master Disk before you can use them.

The final blow is that DOS 3 does not allow you to re-convert your programs back into DOS 2.0S after you converted them to DOS 3. Your only choice was retyping the whole program listing to SAVE on a DOS 2 disk . . . until today!

continued on page 50

NOW! YOU CAN GET THOUSANDS OF FREE PROGRAMS, AND PUT YOUR TELEPHONE TO WORK

With The New ATARI Modem/Software Package For Only \$79.95!

To get more out of your ATARI, whether you're a brand-new owner or a database expert—this offer is for you. The ATARI 1030 is the easiest-to-use modem on the market. And since the experts at ATARI designed it, you're guaranteed that it works with your ATARI Computer System.

The perfect modem package for everyone, it has all the necessary software built right in. All you need is a 16K ATARI computer and a telephone line to get started! If you're a disk drive owner, this package includes additional software (on disk—selected by ANTIC Magazine) that will give your 1030 all the power you'll ever need!

NEW!

- Upload/Download Files With Your Disk Drive
- Auto Dial Telephone Number Database
- Easy Downloading Of Programs From Compuserve's ATARI SIG.
- Easy Access To All Bulletin Board Systems
- Simple ATARI-To-ATARI "Macintosh-Like" Terminal Software

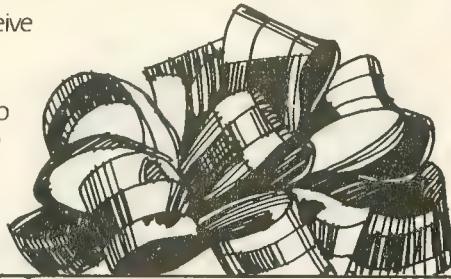
and more...

You'll love the hi-tech design of the 1030 modem. It'll look great next to your computer and peripherals! And hidden inside is the most sophisticated circuitry on the market. This means 100% accurate file transmissions the first time—even over voice-grade phone lines anywhere in the country. Your 1030 modem is built almost to military specs—guaranteed to have less than 1 bit-error out of every 100,000 bits—the lowest in the industry.

And, you'll also receive free introductory subscriptions to Compuserve (access to hundreds of great free programs), and Dow Jones

News Retrieval Service (get stock quotes as fast as your stock broker), with **FREE TIME ON EACH!**

Now ATARI quality at a lower price THAN ANY OTHER MODEM!



YES! I want this extraordinary communications value!

I'm ordering now so I can receive:

- 1 ATARI 1030 300 baud modem with built in software
- Free Introductory Time on: Dow Jones, Compuserve
- Disk Communications Software

The suggested retail value is \$199.95 MY PRICE IS ONLY \$79.95
Send me _____ number of packages at \$79.95 per package to:

Name _____

Address _____

City _____ State _____ Zip _____

Please make check payable to ADD-ON Systems.
Payment enclosed check money order
Bill my Mastercard Visa

ID#

Expires

Credit Card Orders Only Call Toll Free
800 227 1617 X133
800 772 3545 X133 (inside CA)

California residents add 6½% sales tax.
Add shipping charges of \$2.75 per modem.

Canadian residents please send U.S. dollars • Allow 2-4 weeks for delivery
• Prices subject to change without notice • Delivery subject to availability.

Send coupon to:

ADD-ON Systems
524 2nd St.
San Francisco, CA 94107

ESCAPE FROM DOS 3

continued from page 48

PREPARING THE SEQDOS DISKS:

1. Using the SEQDOS.BAS program, prepare one SEQDOS disk with DOS 2 files, and one SEQDOS disk without DOS 2 files. (See Verheiden's article for instructions.)
2. Boot your DOS 3 Master Disk. Initialize the remaining disk with option "I." (Remember to type Y to write the FMS.SYS file.) You should also copy the KCPSYS, KCPOVER.SYS and CONVERT. UTL files from your Master Disk to this disk.
3. Return to the DOS 3 menu and use the "A" option to convert your SEQDOS.BAS program (the one you just typed in) to DOS 3.

4. RUN the converted SEQDOS.BAS program. The computer will print:
"PRESS RETURN TO FORMAT?"

Then press the [BREAK] key and type DOS.

5. When the menu appears, type [S]. Then, type:

AUTORUN.SYS [RETURN]
600 [RETURN]
6FF [RETURN]
609 [RETURN]
[RETURN]

The computer will print:

AUTORUN.SYS SAVED

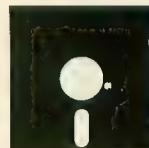
This is your SEQDOS + DOS 3 disk. Remove it and put a write-protect tab on it.

At this point, you should have three disks: A SEQDOS disk, a SEQDOS + DOS 2 disk, and a SEQDOS + DOS 3 disk. You're now ready to convert any BASIC program from DOS 3 to DOS 2.

USING THE SEQDOS DISKS:

1. Boot the SEQDOS + DOS 3 disk, then insert the disk containing the program to be converted. LOAD (or ENTER) your program.
2. Insert your SEQDOS disk and type CSAVE [RETURN].
3. Boot your SEQDOS + DOS 2 disk, then insert your SEQDOS disk. Type CLOAD [RETURN].
4. Your converted program is now in the computer's memory. It can be SAVED or LISTED to any DOS 2 disk.

A



FOR ATARI* 400/800/1200/600XL/800XL*

the XL BOSS

For ATARI* 800XL* and 1200XL* computers

For ATARI 800XL, 1200XL, 600XL with 64k. Replacement operating system to run the vast majority of all ATARI software. No translator or disk to load!

Proper RESET operation especially important for programs like LETTER PERFECT, DATA PERFECT, TEXT WIZARD, etc.

One touch access to extra RAM, all RAM. One touch BASIC on.

Easy plug in installation and much more!

SPECIAL OFFER

Until December 31, 1984 receive MacroMon XL free with purchase of the XL BOSS!—Disk a \$30 value — excellent, unique monitor for beginner and pro alike—written especially for the BOSS.

Please specify computer model. \$79.95 for 800XL/600XL with 64K* \$89.95 for 1200XL*.



PRINTWIZ

An all machine language text, graphics, mixed mode dump for EPSON, GEMINI, NEC, PROWRITER, OKIDATA, M-T SPIRIT, 160L, KXP-1090, DMP-80, ISD 480, SEIKO/AXION GP550A.

Self booting can be used while programming or even running other programs.

Work with or without BASIC, ED/ASM, PILOT, LOGO. Calendar generator. Horizontal format allows text to be continued in same direction. Change widths, height, center and much more from the keyboard or your program. Special handlers for PAINT, Micro-Illustrator, LOGO, Micropainter, etc. Includes LISTER program for inverted and special characters plus demos and ideas. \$29.95* 16K Disk-All Interfaces.

diskwiz-II

Fast and easy to use repair, edit, explore, dup, disk utility package. Single load, single or double density. Special printout capabilities.

Repair or change of linked DOS2 or OSA+2 files, directories, dup filenames. Fast searches, mapping, file trace. Disassembler, speed check and much more! Low priced, fast, easy, and powerful! \$29.95 16K Disk.

Send s.a.s.e. for update info.

*TERMS: U.S. funds; check or M.O. add \$2.50 shipping/handling add 6% CA — 6.5% LA COUNTY add \$3.00 for C.O.D. No charge cards accepted add \$2.50 foreign orders normally out within 48 hours.

P.O. BOX 2205/REDONDO BEACH, CA 90278
(213) 376-4105

* Trademark of Atari, Inc.

SOFTWARE LIBRARY

Antic type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

► NEW LINE-BY-LINE TYPING CORRECTION PROGRAM	
TYPO II	52
► GLOBAL SEARCH COMES TO BASIC	
BASIC SEARCHER	53
► GAME OF THE MONTH	
Q.T.	54
► WORD GAME TO BOGGLE YOUR MIND	
SCRAMBLE	57
► BOLD LETTERING IN GRAPHICS 0	
WIDE TEXT	59
► KOALA IS MIGHTIER THAN MOUSE	
TOUCH TABLET CURSOR	61
► SUPERCHARGER FOR ATARI DOS	
DISKIO	62
► ASSEMBLER SOURCE CODE BONUS HELP!	
INFOBITS	63
ATARI SPECIAL CHARACTERS	52
ERROR FILE	53
TECH TIPS	64

DISK SUBSCRIBERS: You can use all these programs immediately. Just RUN the correct filenames shown at the start of each accompanying magazine article.

Antic Listing Credits: Gemini 10X Printer—\$399 from Star Micronics, Inc., 200 Park Avenue, New York, N.Y. 10166. Lister Plus Software—\$19.95 from Non-Standard Magic, P.O. Box 45, Girard, Ohio, 44420. (48K disk)

How To Use TYPO II

Type in TYPO II and SAVE a copy to disk or cassette.

Type GOTO 32000 and follow TYPO II onscreen instructions. If the resulting two-letter line codes are not exactly the same as those in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [*] followed (without in-between spaces) by the line number, then press [RETURN]. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 (Cassette owners LIST "C:"). Type NEW, then ENTER "D:FILENAME" (Cassette—ENTER "C:"). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

BASIC XL cartridge owners type SET 5,0 and SET 12,0 before using TYPO II.

```
WB 32000 REM TYPO II BY ANDY BARTON
VM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINES(120):CLOSE #2:CLO
SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "E":POSITION 11,1:?"_____"
EM 32050 TRAP 32040:POSITION 2,3:?"Type
in a program line"
HS 32060 POSITION 1,4:?"":INPUT #2:LINE
$:IF LINE$="" THEN POSITION 2,4:LIST B
:GOTO 32060
XH 32070 IF LINES(1,1)="*" THEN B=VAL(LIN
ES(2,LEN(LINES))):POSITION 2,4:LIST B:
GOTO 32060
TH 32080 POSITION 2,10:?"CONT"
MF 32090 B=VAL(LINES):POSITION 1,3:?" ";
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
ET 32120 ? "E":POSITION 11,1:?"_____"
":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3:LINE$:IF
LINE$="" THEN ? "LINE ";B;" DELETED":G
OTO 32050
VV 32150 FOR D=1 TO LEN(LINES):C=C+1:ANS=
ANS+CC*ASC(LINES(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHR$(LCODE)
VG 32220 POSITION 2,13:?"If CODE does no
t match press [RETURN] and edit line a
bove.":GOTO 32050
```

Sometimes it's not easy to tell apart the following characters, shown here in both normal and inverse video. Be especially careful when you type any of these:

✓	█	CTRL F
↖	█	CTRL G
─	█	CTRL N
─	█	CTRL R
+	█	CTRL S

✓	█	/
↖	█	SHIFT +
─	█	SHIFT -
─	█	-
+	█	+

Typing Special Atari Characters

Shown below are the Atari Special Characters as printed in Antic listings—and the keys you must type in order to get them.

Whenever the CTRL key (CONTROL on XL models) or SHIFT key is used, *hold it down* while you press the next keys. Whenever the ESC key is used, *press and release* it before typing the next keys.

Turn on inverse video by pressing the Atari logo key once. Turn it off by pressing a second time. (XL models use the Reverse Video Mode Key instead.)

INVERSE VIDEO

FOR THIS	TYPE THIS
█	„CTRL ,
█	„CTRL A
█	„CTRL B
█	„CTRL C
█	„CTRL D
█	„CTRL E
█	„CTRL F
█	„CTRL G
█	„CTRL H
█	„CTRL I
█	„CTRL J
█	„CTRL K
█	„CTRL L
█	„CTRL M
█	„CTRL N
█	„CTRL O
█	„CTRL P
█	„CTRL Q
█	„CTRL R
█	„CTRL S
█	„CTRL T
█	„CTRL U
█	„CTRL V
█	„CTRL W
█	„CTRL X
█	„CTRL Y
█	„CTRL Z
█	ESC
█	SHIFT
█	DELETE
█	ESC
█	SHIFT
█	INSERT
█	ESC
█	CTRL
█	TAB
█	ESC
█	SHIFT
█	TAB
█	„CTRL .
█	„CTRL ;
█	„SHIFT
█	CLEAR
█	ESC DELETE
█	ESC TAB

Boxes are drawn around the normal video characters here so you can see their positions more accurately; these boxes do not appear in the printed listings.

BASIC SEARCHER

Article on page 17.

LISTING 1

```

OC 31900 REM SEARCH UTILITY
BC 31901 REM BY SCOTT SHECK
GN 31902 REM ANTIC MAGAZINE
FR 31903 GOSUB 31907:POKE 4,1:POKE 2,PEEK
(136):POKE 3,PEEK(137)
BL 31904 ZZ=USR(1536):IF PEEK(4)=0 THEN 3
1925
JF 31905 A=PEEK(0)+PEEK(1)*256:IF X=10 TH
EN LIST "P",A:GOTO 31904
GX 31906 LIST A:GOTO 31904
AW 31907 RESTORE 31908:GRAPHICS 0:IF PEEK
(1537)<>216 THEN FOR X=1536 TO 1638:RE
AD A:POKE X,A:NEXT X
XG 31908 DATA 104,216,160,0,177,2,133,0,2
00,177,2,133,1,201,124,208,11,165,0,20
1,156,208,5,160,0
RP 31909 DATA 132,4,96,200,177,2,133,204,
200,200,177,2,197,203,208,4,32,91,6,96
,201,0,240,35,201,1
CX 31910 DATA 240,31,201,14,208,4,169,7,2
08,7,201,15,208,11,200,177,2,132,206,2
4,101,206,168,177,2,201,20
YU 31911 DATA 240,209,201,22,208,206,32,9
1,6,76,2,6,0
QH 31912 DATA 165,2,24,101,204,133,2,144,
2,230,3,96
SJ 31913 ? :? ,,"SEARCH UTILITY":POKE 82,0
:COUNT=128:ZZ=PEEK(130)+PEEK(131)*256:
? :? COUNT;" "

```

```

MN 31914 A=PEEK(ZZ):?: CHR$(A-128*(A>=128))
?:IF A<128 THEN 31919
VI 31915 COUNT=COUNT+1:IF PEEK(ZZ+1)=98 A
ND PEEK(ZZ+2)=218 THEN 31920
TZ 31916 IF COUNT=148 THEN POKE 82,14:POS
ITION 14,2
KU 31917 IF COUNT=168 THEN POKE 82,28:POS
ITION 28,2
AW 31918 ? :? COUNT;" "
YM 31919 ZZ=ZZ+1:GOTO 31914
MR 31920 POKE 82,2:POSITION 2,23:? :? "NU
MBER";:INPUT A:POKE 203,A:? "SCREEN OR
PRINTER";
IK 31921 X=PEEK(764):IF X<>10 AND X<>62 T
HEN 31921
JJ 31922 ? :"":RETURN
WF 31923 ? :"":FOR ZZ=31900 TO 31914:?
ZZ:NEXT ZZ:? "CLR:POKE842,12:CONT";:P
OSITION 2,0:POKE 842,13:STOP
BB 31924 ? :"":FOR ZZ=31915 TO 31928:?
ZZ:NEXT ZZ:? "CLR:POKE842,12:?CHR$(12
5)"::POSITION 2,0:POKE 842,13:END
TO 31925 ? :? "END OF SEARCH":? :? " AGAI
N (Y/N) ?"::POKE 764,255
KZ 31926 IF PEEK(764)=43 THEN POKE 764,25
5:GOTO 31900
VO 31927 IF PEEK(764)=35 THEN POKE 764,25
5:GOTO 31923
JK 31928 GOTO 31926

```

ERROR FILE

OCTOBER OMISSIONS October '84

A number of division signs [/] were omitted at the printer. On the magazine pages there is an empty space where they should have appeared. Here are the specific corrections:

MOLE ATTACK

Page 53
Line 20: POKE 756,S/256

Page 54
Line 1060: T=18-L/2

Page 55
Lines 1090 and 1110:
PEEK (20)0/(60)
Line 1140: 756,S/256

Line 1160:
IF AB/2<>INT (AB/2)
Line 1170: AC=1 TO AB/2
Line 1330: 756,S/256

PLUS MINUS

Page 56
Line 469:
SOUND 0,40,10,N/4
Line 9020: CHBASE/256
Page 57
Line 10014:0*,./:

BOUNCING BALL

Page 57
Line 110: INT(X/256)

ANTIC 4/5 ANIMATOR/ EDITOR

Page 59
Line 84: ANTIC 4/5
Page 63—In an unrelated error, the following two lines were left out of listing 3:
2820 FOR J=1 TO 10:
FOR I=0 TO 8
2822 K=USR(COPY
,48,F(10+I),AW)

Page 66
“HYPNO.BAS”
Line 210: ADDRESS/256

Line 220: (BYTES/256)

“DEMO”

Line 10: ERASE/PRINT

DIVER

Page 69
Line 550: #6;"/"
Line 630: 0)*20)/(SK+1)
Line 650: *200)/(SK+1))
Line 670: *15)/(SK+1))

continued on next page

Q.T.

Article on page 30.

LISTING 1

```

PT 1 REM Q.T. BY BRIAN MCWILLIAMS
NC 2 REM ANTIC MAGAZINE JUNE 1984
NH 10 DIM MOVES(32),AS(5):LIVES=3:OFF=729
  0:C1=1:GOSUB 10000
TE 20 FOR X=C1 TO PEEK(1699):AS(X,X)=STR$(
  PEEK(1699+X)):NEXT X:HI=VAL(AS)
IK 50 COLOR 61:PLOT 0,C1:DRAWTO 19,C1:PLO
  T 0,21:DRAWTO 19,21
GM 55 PLOT 2,5:DRAWTO 17,5:DRAWTO 17,9:DR
  AWTO 2,9:DRAWTO 2,5
XF 60 COLOR 162:PLOT 0,2:DRAWTO 0,20:PLOT
  19,2:DRAWTO 19,20:COLOR 34:PLOT 4,2:D
  RAWTO 4,4:PLOT 15,2:DRAWTO 15,4
EG 70 COLOR 47:PLOT 4,11:DRAWTO 8,11:DRAW
  TO 8,15:DRAWTO 4,15:DRAWTO 4,11:PLOT 1
  1,11:DRAWTO 15,11:PLOT 13,12
WV 80 DRAWTO 13,15:PLOT 7,14:PLOT 9,16:CO
  LOR 175
HY 85 PLOT 11,15:PLOT 15,15:POSITION 3,6:
  ? #6;"antic Magazine":POSITION 6,8
KO 90 ? #6;"PRESENTS":POSITION 3,18:#6;
  "Programmed by":POSITION 2,20:#6;"B
  RIAN MCWILLIAMS"
GJ 100 GOSUB 7000:BRD=BRD+(BRD<3)-2*(BRD=
  3):BIC=BIC+(BRD=C1):Z=50*BIC:POSITION
  C1,23:#6;"top ";HI
IO 105 IF BIC=7 THEN 1800
YH 125 BI=72*(BIC=C1)+74*(BIC=2)+75*(BIC=
  3)+58*(BIC=4)+86*(BIC=5)+81*(BIC=6):GO
  SUB 7020:IF BRD=C1 THEN GOSUB 1640
WM 130 GOSUB 7020:COLOR 61:PLOT 0,C1:DRAW
  TO 19,C1:DRAWTO 19,22:DRAWTO 0,22:DRAW
  TO 0,C1
OB 140 GOSUB 7100:GOSUB 7110:TIME=750-(BI
  C*50):NI=10+5*BIC:GOSUB 7130
SG 150 ON BRD GOSUB 200,800,1050
LS 160 GOTO 100

```

```

RJ 200 COLOR 47:FOR X=C1 TO 75+10*BIC
OG 210 A=INT(18*RND(0))+C1:B=INT(20*RND(0
  ))+2:LOCATE A,B,C:IF C>32 THEN 210
GA 220 PLOT A,B:NEXT X:FOR X=C1 TO 4
FK 240 A=INT(16*RND(0))+2:B=INT(18*RND(0)
  )+3:LOCATE A,B,C:IF C>36 AND C<41 OR A
  =9 AND B=9 THEN 240
HV 250 COLOR 36+X:PLOT A,B:NEXT X:BC=42:X
  P=9:YP=10:GOSUB 7065
GH 300 IF NOT STRIG(0) THEN GOSUB 460
KL 310 A=STICK(0):A=(A=14 OR A=10 OR A=6)
  +2*(A=7)+3*(A=13 OR A=9 OR A=5)+4*(A=1
  1):ON A GOSUB 350,420,410,440
VB 320 LOCATE C1,2,UL:LOCATE 18,2,UR:LOCA
  TE 18,21,LR:LOCATE C1,21,LL:IF UL=37 A
  ND UR=38 AND LR=39 AND LL=40 THEN 600
XW 340 GOSUB 7300:POKE 77,0:GOTO 300
QP 350 Y=-C1:X=0
GS 360 LOCATE XP+X,YP+Y,C:IF C=32 THEN GO
  SUB 7030:RETURN
PH 370 IF C=47 THEN GOSUB 7090:GOSUB 7030
  :RETURN
LQ 380 IF NOT X THEN IF C>36 AND C<41 OR
  C=BI THEN 400
ZR 390 RETURN
KK 400 LOCATE XP+X*2,YP+Y*2,CC:IF CC=32 T
  HEN GOSUB 7040:GOSUB 7030
ZP 405 RETURN
GQ 410 Y=C1:X=0:GOTO 360
OO 420 IF BC=43 THEN BC=42:Y=0:X=0:GOSUB
  7030:RETURN
BM 430 Y=0:X=C1:GOTO 360
PF 440 IF BC=42 THEN BC=43:Y=0:X=0:GOSUB
  7030:RETURN
UN 450 Y=0:X=-C1:GOTO 360
JC 460 C=44*(BC=42)+95*(BC=43):COLOR C:PL
  OT XP,YP

```

ERROR FILE

EXPLORING THE XL

June '84

There was a misprinted inverse video zero. In line 230, what appears as inverse "Or" should instead read "0r", replacing the capital letter with a zero.

RECALL

August '84

To get this program to run, you must first 'LIST' it to disk or cassette, type 'NEW' then

type: DIM QQ\$(1). After this, 'ENTER' the program and it should run. 'SAVE' this version which will run from then on without the preliminaries.

CREEPY CAVERNS

August '84

In line 10, change MO(N,5) to MO(P,5). In line 349, there is a YO(Y-ZERO) that should be YO (Y-O). The first change will prevent an error 3 and the second an error 9.

SPACED-OUT NUMBERS

July '84

For non-XL machines, change line 31040 as follows:
 31040 D=INT(VAL(C\$)/
 INT(100^(68-B(0))+
 1.0E-03)).

MATCHBOX TIC-TAC-TOE

April '84

Change line 2078 to: 2078
 CLOSE #3:RETURN

UPDATE DISKS WITH NOTE AND POINT

April '84

Line 160 should read GOTO 600. Lines 410, 440, 470, 500 and 530 should all begin: INLEN=LEN(USER\$).

MATH WIZARD

April '84

The 17th string character in line 50 should be an inverse zero. This will generate the proper Typo table.

See

TYPO II

Page 52

LQ 465 FOR X=85 TO 45 STEP -C1:SOUND 0,X,
10,10:NEXT X:GOSUB OFF
UY 470 GOSUB 7065:LOCATE XP-(BC=43)+(BC=4
2),YP,C:IF C=32 OR C=61 THEN RETURN
IB 490 IF BC=42 THEN 520
LX 500 FOR X=XP-C1 TO C1 STEP -C1:LOCATE
X-C1,YP,CC:IF CC<>32 THEN GOSUB OFF:RE
TURN
EY 510 SOUND 0,114-X,10,12:COLOR 32:PLOT
X,YP:COLOR C:PLOT X-C1,YP:NEXT X:GOSUB
OFF:RETURN
KV 520 FOR X=XP+C1 TO 18:LOCATE X+C1,YP,C
C:IF CC<>32 THEN GOSUB OFF:RETURN
ZK 530 SOUND 0,114+X,10,12:COLOR 32:PLOT
X,YP:COLOR C:PLOT X+C1,YP:NEXT X:GOSUB
OFF:RETURN
JN 600 GOSUB 7150:FOR X=2 TO 21:LOCATE C1
,X,C:IF C=32 OR C=42 OR C=43 THEN 620
JT 610 POSITION C1,X:GOSUB 640
PR 620 LOCATE 18,X,C:IF C=32 OR C=42 OR C
=43 THEN 650
HM 630 POSITION 18,X:GOSUB 640:GOTO 650
UC 640 ? #6;CHR\$(BI+128):GOSUB 7180:RETUR
N
LM 650 NEXT X:SCORE=SCORE+BONUS+TIME:GOSU
B OFF:RETURN
OX 660 COLOR 32:PLOT 0,2:PLOT 0,3:PLOT 19
,2:PLOT 19,3:PLOT 4,22:DRAWTO 15,22:CO
LOR 61: PLOT 0,4:DRAWTO 2,4:PLOT 19,4
RN 810 DRAWTO 17,4:PLOT 3,21:PLOT 16,21:P
LOT 3,20:DRAWTO 16,20:COLOR 34:PLOT C1
,2:PLOT C1,3
YI 820 PLOT 18,2:PLOT 18,3:PLOT 0,5:DRAWT
0,0,21:PLOT 2,5:DRAWTO 2,21:PLOT 19,5:
DRAWTO 19,21:PLOT 17,5:DRAWTO 17,21
GA 830 COLOR 93:PLOT 2,3:COLOR BI+128:PLO
T 17,3:NM=3:NH=NM
WU 850 XP=9:YP=19:BC=42:GOSUB 7065
NB 860 FOR XX=C1 TO 11-BIC:A=STICK(0):A=(
A>4 AND A<8)+2*(A>8 AND A<12)
RB 865 COLOR 62:PLOT 2,NM:ON A GOSUB 420,
440:GOTO 875
OC 870 FOR A=C1 TO 10:NEXT A
YW 875 COLOR 93:PLOT 2,NM:NEXT XX
OU 880 A=INT(4*RND(0))+C1:IC=64*(A=1)+47*
(A=2)+35*(A=3)+BI*(A=4):IP=INT(14*RND(
0))+3
CV 885 IV=Z*(IC=BI)+50*(IC=64 OR IC=47)
ZW 890 FR=(IC=64 OR IC=58 OR IC=72 OR IC
=74)+2*(IC=75 OR IC=47)+3*(IC=35 OR IC
=86 OR IC=81)
GC 895 A=INT(2*RND(0))+C1:IC=IC+128*(A=2)
FF 900 FOR XX=2 TO 18 STEP FR:COLOR IC:PL
OT IP,XX:A=STICK(0):A=(A>4 AND A<8)+2*
(A>8 AND A<12)
VW 905 IF NOT A THEN FOR X=C1 TO 10:NEXT
X
HS 907 ON A GOSUB 420,440:COLOR 32:PLOT I
P,XX
WS 910 SOUND C1,57+XX,10,9:NEXT XX:SOUND
C1,0,0,0:LOCATE IP,19,C:IF C<>32 THEN
IF IC=163 OR IC=35 THEN 7190
OG 920 COLOR IC:PLOT IP,18+(C=32):FOR X=C
1 TO 5:NEXT X:X=IP-XP:Y=-C(C>>32):GOSUB
7090:COLOR 32:PLOT XP+X,YP+Y
MJ 925 IF IC=163 OR IC=35 THEN 860
SW 930 IF C=32 THEN 1000
VV 940 COLOR 32:PLOT 17,NH:POSITION 17,NH
+C1: ? #6;CHR\$(BI+128):CHR\$(34);":COL
OR 61:PLOT 17,NH+2:DRAWTO 19,NH+2
JO 950 NH=NH+C1:GOSUB 7170:GOSUB OFF:SCOR
E=SCORE+IV
SW 960 GOSUB 7100:IF NH<19 THEN 860
MI 970 X=C1:Y=0:FOR XX=XP TO 17:GOSUB 420
:NEXT XX:GOSUB 7150:FOR XX=NM TO 18:GO
SUB 7160:GOSUB 7180:NEXT XX
VS 980 SCORE=SCORE+BONUS:RETURN
RM 990 GOTO 860

UZ 1000 GOSUB 7160:IF NM<19 THEN 860
IM 1020 FOR X=2 TO XP:COLOR 62:PLOT X,19:
FOR Y=C1 TO 5:SOUND 0,157-X,10,10:NEXT
Y:COLOR 93:PLOT X,19:GOSUB OFF
WY 1030 FOR Y=C1 TO 5:NEXT Y:COLOR 32:PL0
T X,YP:NEXT X:GOSUB OFF:GOTO 7190
NE 1050 COLOR 32:PLOT C1,22:DRAWTO 18,22:
COLOR 61:PLOT C1,4:DRAWTO 4,4:PLOT 15,
4:DRAWTO 18,4
YE 1070 XP=4:YP=3:BC=42:GOSUB 7065
LB 1080 IF BLL THEN 1100
SO 1090 FOR XX=C1 TO 11-BIC
KV 1095 IF NOT NI THEN RETURN
BI 1100 POKE 77,0:GOSUB 7100:IF NOT STRI
G(0) THEN 1500
ZF 1105 FOR A=C1 TO 25:NEXT A
EN 1110 B=STICK(0):A=(B>4 AND B<8 AND BC<
>92)+2*(B>8 AND B<12 AND BC<>92)+3*(B>
4 AND B<8 AND BC=92)
AH 1120 A=A+4*(B>8 AND B<12 AND BC=92):ON
A GOSUB 420,440,1550,1530:GOTO 1140
YC 1130 FOR A=C1 TO 15:NEXT A
CA 1140 LOCATE XP,YP+C1,C:IF C=32 AND BC<
>92 THEN BC=92:GOSUB 7065
VG 1150 IF C=61 AND BC=92 THEN BC=42*(XP<
5)+43*(XP>14):GOSUB 7065
LU 1160 IF C=33 OR C=161 THEN C=92:GOTO 1
320
UD 1170 IF BC=92 AND YP=22 THEN 1600
OG 1180 IF STRIG(0) AND BC=92 THEN COLOR
32:PLOT XP,YP:YP=YP+C1:GOSUB 7065
WS 1190 IF NOT BLL AND XX THEN NEXT XX:X
=0
OC 1200 IF BLL THEN 1240
EF 1210 A=INT(3*RND(0))+C1:IC=35*(A=C1)+6
3*(A=2)+BI*(A=3):A=INT(2*RND(0))+C1
EP 1220 BLL=33*(A=C1)+161*(A=2):IP=INT(18
RND(0))+C1:IV=10(IC=35)+50*(IC=63)+2
*(IC=BI)
ZA 1230 FR=(IC=35)+2*(IC=63 OR IC=75 OR I
C=74 OR IC=72)+3*(IC=58 OR IC=81 OR IC
=86):BLLY=28
MM 1235 A=INT(2*RND(0))+C1:IC=IC+128*(A=2
)
IO 1240 FOR A=BLLY-C1 TO BLLY-FR STEP -C1
:LOCATE IP,A,C:IF C=32 THEN NEXT A
UB 1300 COLOR 32:PLOT IP,BLLY:DRAWTO IP,B
LLY+2:BLLY=A+C1:COLOR BLLY:PLOT IP,BLLY
:COLOR 41:PLOT IP,BLLY+C1:COLOR IC
EG 1310 PLOT IP,BLLY+2:SOUND C1,150+BLLY,
10,3:IF C=32 THEN 1080
BT 1320 COLOR 59:PLOT IP,BLLY:FOR X=10 TO
0 STEP -C1:SOUND C1,56,8,X:NEXT X:SOU
ND C1,0,0,0:COLOR 32:PLOT IP,BLLY
FA 1325 IF C=92 THEN SCORE=SCORE+IV
AF 1327 BLL=0:NI=NI-C1
WU 1330 COLOR 32:PLOT IP,BLLY+C1:FOR A=BL
LY+3 TO 22:LOCATE IP,A,C:IF C=92 THEN
COLOR 32:PLOT IP,A-C1:GOTO 1600
IM 1340 COLOR 32:PLOT IP,A-C1:COLOR IC:PL
OT IP,A:SOUND 0,124+A,10,12:NEXT A:SOU
ND 0,0,0,0
XV 1350 COLOR 32:PLOT IP,A-C1:GOTO 1090
UT 1500 BC=92:GOSUB 7065:FOR X=0 TO 10 ST
EP 2:SOUND 2,150,8,X:NEXT X:COLOR 36:P
LOT XP,YP:FOR X=10 TO 0 STEP -2
IH 1510 SOUND 2,150,8,X:NEXT X:LOCATE XP,
YP-C1,C:IF C=32 THEN COLOR C:PLOT XP,Y

continued on next page

P:YP=YP-C1:GOSUB 7065
 X0 1520 SOUND 2,0,0,0:GOTO 1110
 OA 1530 X=-C1
 OG 1535 LOCATE XP+X,YP,C:IF C<>32 THEN X=0
 YK 1540 COLOR 32:PLOT XP,YP:XP=XP+X:GOSUB 7065:X=0:RETURN
 OP 1550 X=C1:GOTO 1535
 KD 1600 FOR X=0 TO 2:SOUND X,0,0,0:NEXT X:COLOR 32:PLOT XP,YP
 CN 1605 COLOR 61:PLOT 8,22:DRAWTO 10,22:C
 OLOR 41:PLOT 8,21:PLOT 8,20:PLOT 10,21
 :PLOT 10,20:COLOR 161:PLOT 8,19
 YU 1610 PLOT 10,19:COLOR 45:PLOT 9,21:FOR
 X=21 TO 15 STEP -C1:COLOR 32:PLOT 8,X
 +C1:DRAWTO 10,X+C1
 GF 1620 COLOR 61:PLOT 8,X:DRAWTO 10,X:COL
 OR 45:PLOT 9,X-C1:COLOR 41:PLOT 8,X-2:
 PLOT 10,X-2:COLOR 161:PLOT 8,X-3
 HT 1630 PLOT 10,X-3:FOR Y=C1 TO 10:NEXT Y
 :NEXT X:XP=9:YP=X:GOTO 7190
 TD 1640 YP=13:BC=42
 GC 1645 GOSUB 7020:COLOR 32:PLOT C1,22:DRA
 WTO 18,22:COLOR BI
 IZ 1647 PLOT 13+BIC,14:COLOR 42:YP=13:PLO
 T 5+BIC,YP:RESTORE 1700
 MZ 1650 FOR XP=6+BIC TO 13+BIC:COLOR 32:P
 LOT XP-C1,13:GOSUB 7065:READ A,B:SOUND
 0,A,10,10:FOR X=C1 TO B:NEXT X
 AZ 1660 FOR X=10 TO 0 STEP -C1:SOUND 0,A,
 10,X:NEXT X:XP=XP-C1:FOR XX=C1
 TO 9:GOSUB 410:NEXT XX
 BD 1670 BC=92:FOR YP=21 TO 8 STEP -C1:COL
 OR 32:PLOT XP,YP+C1:GOSUB 7065:READ A:
 SOUND 0,A,10,10:FOR X=C1 TO 2:NEXT X
 HZ 1680 COLOR 36:PLOT XP,YP:FOR X=10 TO 0
 STEP -C1:SOUND 0,A,10,X:NEXT X:NEXT Y
 P:RETURN
 GH 1700 DATA 68,50,102,50,76,50,114,100,1
 14,50,76,50,68,50,85,100
 WD 1710 DATA 47,243,53,243,96,243,60,243,
 53,243,47,243,60,243
 ZN 1800 GOSUB 7020:COLOR 34:PLOT 6,C1:DRA
 WTO 6,9:PLOT 13,C1:DRAWTO 13,9:COLOR 6
 1:PLOT 5,10:DRAWTO 14,10
 EZ 1810 DRAWTO 14,12:DRAWTO 5,12:DRAWTO 5
 ,10:POSITION 6,11:? #6;"you win~":POSI
 TION 2,15:? #6;"CONGRATULATIONS~"
 PS 1820 IF SCORE>HI THEN 7270
 UZ 1830 GOTO 7280
 LM 1840 CLR :END
 DH 7000 POSITION 3,0:? #6;"PRESS TRIGGER"
 GS 7005 POKE 77,0:IF STRIG(0) THEN 7005
 AI 7010 RETURN
 GT 7020 COLOR 32:FOR X=0 TO 22:PLOT 0,X:D
 RAWTO 19,X:NEXT X:RETURN
 NH 7030 COLOR 32:PLOT XP,YP:XP=XP+X:YP=YP
 +Y:GOSUB 7065:SOUND 0,57,10,10:GOSUB 0
 FF:RETURN
 TS 7040 COLOR 32:PLOT XP+X,YP+Y:COLOR C:P
 LOT XP+X*2,YP+Y*2:SOUND 0,217,10,10:GO
 SUB OFF:RETURN
 GQ 7065 COLOR BC:PLOT XP,YP:RETURN
 CV 7090 COLOR 59:PLOT XP+X,YP+Y:FOR A=C1
 TO 2:SOUND 0,68,10,4:NEXT A:FOR A=C1 T
 O 2:SOUND 0,85,10,4:NEXT A
 IW 7095 GOSUB OFF:SCORE=SCORE+10*(BRD-C1)
 :RETURN
 PC 7100 POSITION 2,C1:? #6:SCORE;"=":RETU
 RN
 YM 7110 COLOR 170:IF LIVES THEN FOR X=C1
 TO LIVES:PLOT 14+X,C1:NEXT X:COLOR 61:
 PLOT 14+LIVES+C1,C1:RETURN
 EJ 7120 COLOR 61:PLOT 15,C1:DRAWTO 17,C1:
 RETURN
 ML 7130 IF BRD=C1 THEN POSITION 9,C1:? #6
 :TIME;"="

AT 7140 RETURN
 QX 7150 BONUS=0:POSITION 5,11:? #6;"bonus
 x ":"Z:RETURN
 OU 7160 COLOR 32:PLOT 2,NM:POSITION 0,NM+
 C1:? #6;" ";CHR\$(34);"?":COLOR 61:PLOT
 0,NM+2:DRAWTO 2,NM+2:NM=NM+C1
 OF 7170 FOR X=C1 TO 2:SOUND 0,128,10,15:N
 EXT X:GOSUB OFF:RETURN
 IN 7180 SOUND 0,X+124,10,10:BONUS=BONUS+Z
 :POSITION 8,13:? #6:BONUS=GOSUB OFF:FO
 R A=C1 TO 25:NEXT A:RETURN
 MR 7190 COLOR 45:PLOT XP,YP:RESTORE 7250:
 FOR X=C1 TO 5:READ A,B:SOUND 0,A,12,10
 :FOR Y=C1 TO B:NEXT Y
 WU 7200 FOR Y=10 TO 0 STEP -C1:SOUND 0,A,
 12,Y:NEXT Y:NEXT X:LIVES=LIVES-C1:IF
 NOT LIVES THEN 7260
 EG 7210 COLOR 32:PLOT XP,YP:GOSUB 7110:ON
 BRD GOTO 7230,7220,7230
 QY 7220 IF NM<19 THEN 850
 AQ 7230 GOSUB 7020:GOTO 130
 JZ 7250 DATA 85,85,76,25,72,25,85,50,60,1
 00
 LV 7260 GOSUB 7120:POSITION 4,10:? #6;"en
 d of game":IF SCORE<=HI THEN 7280
 OM 7270 AS=STR\$(SCORE):POKE 1699,LEN(AS):
 FOR X=C1 TO LEN(AS):POKE 1699+X,VAL(AS
 (X)):NEXT X
 CK 7280 GOSUB 7000:GOTO 1840
 RZ 7290 SOUND 0,0,0,0:RETURN
 EJ 7300 TIME=TIME-C1:GOSUB 7130:GOSUB 710
 0:IF NOT TIME THEN POP :GOTO 7190
 AO 7310 RETURN
 WJ 10000 RESTORE 10061:C=PEEK(106)-5:BASE
 =(C+C1)*256:POKE 559,0:POKE 186,C:GRAP
 HICS 17
 XW 10010 FOR X=C1 TO 32:READ Y:MOVES(X)=C
 HRS(Y):NEXT X:JUNK=USR(ADR(MOVES),BASE
 ,57344):POKE 756,BASE/256
 AT 10020 TRAP 10060:READ INSET:FOR X=BASE
 +INSET*8 TO BASE+INSET*8+7
 EC 10030 READ CHANGE:POKE X,CHANGE:NEXT X
 :GOTO 10020
 IO 10060 POKE 559,254:RETURN
 TW 10070 DATA 104,104,133,215,104,133,214
 ,104,133,213,104,133,212,162,4,160,0,1
 77,212,145,214,200,208,249
 LA 10075 DATA 230,213,230,215,202,208,240
 ,96
 JY 10080 DATA 29,170,85,170,85,170,85,170
 ,85,2,24,126,98,66,66,98,126,24,15,0,1
 26,126,126,126,126,126,0
 OK 10090 DATA 10,8,20,24,56,56,112,96,152
 ,5,0,126,70,94,94,126,126,0,6,0,126,98
 ,122,122,126,126,0
 NF 10100 DATA 7,0,126,126,122,122,98,126,
 0,8,0,126,126,94,94,78,126,0,12,8,20,2
 4,58,62,112,96,152
 XE 10110 DATA 13,160,0,12,68,190,127,0,0,
 11,16,40,24,28,28,14,6,25,63,16,40,24,
 92,124,14,6,25
 QU 10120 DATA 27,146,84,0,198,0,84,146,0,
 26,254,254,170,138,170,254,254,0,40,12
 4,68,108,56,16,24,16,24
 TI 10130 DATA 61,0,0,48,94,116,106,62,0,3
 0,8,12,56,80,96,74,62,0,32,24,60,60,12
 6,126,126,126,60
 EK 10140 DATA 3,0,255,126,126,126,255,0,0
 PW 10150 DATA 1,124,246,250,254,254,124,5
 6,16,9,16,16,16,16,16,16,31,104,
 88,104,92,116,56,0,0
 QI 10160 DATA 60,0,195,36,24,24,36,0,0,4,
 0,0,0,126,153,36,0,0,42,24,60,36,36,12
 6,126,126,126
 UD 10170 DATA 43,16,56,124,124,124,124,25
 4,8,49,112,64,110,72,126,2,14,0,54,60,
 126,98,126,126,126,84,0
 HX 10180 DATA 62,12,12,24,24,48,48,0,48

SCRAMBLE

Article on page 33.

See

TYPO II

Page 52

LISTING 1

```

GP 10 REM SCRAMBLE
GJ 15 REM BY F. NEIL SIMMS
RG 20 REM ANTIC MAGAZINE
FF 30 GOSUB 5000:GOTO 1000:REM ** init and begin **
RQ 38 REM ** time delay loop **
LQ 40 IF PEEK(540)<>0 THEN 40
ZV 50 RETURN
PZ 53 REM ** INPUT: string TPS **
OC 54 REM ** OUTPUT: LN (nonblank LEN(TPS))
    1) **
LP 55 FOR K=1 TO 10:IF TPS(K,K)=" " THEN
LN=K-1:POP :GOTO 65
CN 60 NEXT K:LN=10
AG 65 RETURN
UO 198 REM ** move cursor **
CO 200 TX=X(PLR):TY=Y(PLR):LOCATE TX,TY,Z
:COLOR Z-32:POKE 53760+I,I*40+40:POKE
53761+I,168:POKE 77,0
AD 203 IF FIRST(PLR) THEN COLOR Z:FIRST(PLR)=0
BL 204 PLOT TX,TY
RS 205 IF ST=14 OR ST=10 OR ST=6 THEN TY=
TY-1:IF TY<3 THEN TY=7
CT 210 IF ST=9 OR ST=5 OR ST=13 THEN TY=T
Y+1:IF TY>7 THEN TY=3
MZ 220 IF ST>8 AND ST<12 THEN TX=TX-1:IF
TX<3+XOFF THEN TX=7+XOFF
ZK 230 IF ST>4 AND ST<8 THEN TX=TX+1:IF T
X>7+XOFF THEN TX=3+XOFF
PR 250 LOCATE TX,TY,Z:COLOR Z+32:PLOT TX,
TY:X(PLR)=TX:Y(PLR)=TY
ZK 260 RETURN
GC 398 REM ** mark square or end word **
AA 400 FIRE(PLR)=1
JK 405 WD=WORDS(PLR):TX=X(PLR):TY=Y(PLR):
LOCATE TX,TY,Z:IF Z>122 THEN 500
TJ 410 IF LT=0 THEN 480:REM ** always mark
square if first letter **
ZT 420 IF ABS(PREVX(PLR)-TX)>1 OR ABS(PREVY(PLR)-TY)>1 THEN 600
FX 480 POKE 53760+I,I*60+60:POKE 53761+I,
168:COLOR Z+128:PLOT TX,TY:PREVX(PLR)=
TX:PREVY(PLR)=TY
SG 490 TS(TOFF+LT,TOFF+LT)=CHR$(Z-32):IF
LT<9 THEN LNG(PLR)=LT+1
OO 495 GOTO 600
KY 499 REM ** square was already marked -
process word if valid **
WM 500 IF WD>99 THEN SOUND PLR,255,10,8:G
OTD 600:REM ** array full **
UU 505 POKE 53760+I,I*60+60:POKE 53761+I,
168:IF LNG(PLR)<3 THEN 515:REM ** word
is too short to count **
AP 510 AOFF=PLR*1000+WD*10:ARS(AOFF+1,AOF
F+10)=TS(TOFF,TOFF+9):WORDS(PLR)=WD+1
UB 515 TS(TOFF,TOFF+9)=BLS
KH 520 IF NOT PLR THEN FOR Y=3 TO 7:I=(Y-
3)*5:POSITION 3,Y:?:#6:BS(I+1,I+5):NE
XT Y:GOTO 540
ES 530 FOR Y=3 TO 7:I=(Y-3)*5:POSITION 12
,10-Y:?:#6:BS(I+1,I+5):NEXT Y
US 540 LNG(PLR)=0:POKE 87,1:POSITION 1+15
*PLR,11:?:#6:WORDS(PLR):
```

```

UY 550 LOCATE TX,TY,Z:COLOR Z+32:PLOT TX,
TY
ZC 600 RETURN
ZJ 998 REM ** Main play loop **
AE 1000 POKE 53761+PLR*2,0
MI 1002 IF STRIG(0) AND FIRE(0) THEN FIRE
(0)=0
PQ 1003 IF STRIG(1) AND FIRE(1) THEN FIRE
(1)=0
FW 1004 IF PEEK(542)<>0 THEN 1002
OX 1005 POKE 542,5:PLR= NOT PLR:XOFF=9*PL
R:TOFF=10*PLR+1:LT=LNG(PLR):WD=WORDS(PL
R):I=PLR*2:POKE 87,2
FM 1010 ST=STICK(PLR):IF ST<>15 THEN GOSU
B 200:GOTO 1030
ZD 1020 T=STRIG(PLR):IF NOT T AND NOT F
IRE(PLR) THEN GOSUB 400
EH 1029 REM ** update TIME **
KE 1030 TI=PEEK(540):IF TI THEN 1050
YW 1035 TIME=TIME-1
HI 1040 POKE 540,60:POKE 87,1:POSITION 9,
11:?:#6:TIME;" ":"IF NOT TIME THEN 12
00
HS 1050 GOTO 1000:REM ** end of main loop
**
SA 1198 REM ** end of round **
ML 1200 GOSUB 2700:FOR I=10 TO 0 STEP -1:
3:POKE 53279,0:POKE 540,I:GOSUB 40:NEX
T I
OT 1205 POKE 87,2:POSITION 5,0:?:#6;"dupl
icates":FOR L=0 TO 1
GH 1210 IF WORDS(L)>1 THEN PLR=L:GOSUB 30
00
GG 1220 NEXT L
GI 1230 IF WORDS(0)<1 OR WORDS(1)<1 THEN
1240
LL 1235 GOSUB 2800:POSITION 5,0:?:#6;" ma
tches":":GOSUB 3300
PA 1240 GOSUB 2800:POSITION 1,9:?:#6;"acc
ept <> reject"
YK 1250 POSITION 5,0:?:#6;" SCORING":":F
OR L=0 TO 1:PLR=L:GOSUB 3500:NEXT L
UI 1260 POSITION 0,0:FOR I=0 TO 9:?:#6:BL
S:BLS:;NEXT I:POSITION 1,4:?:#6;"SCOR
ING COMPLETED":POKE 540,200:GOSUB 40
PW 1270 IF SCORE(0)<WIN AND SCORE(1)<WIN
THEN 1300:REM ** skip following if not
end of game **
PK 1280 IF SCORE(0)>SCORE(1) THEN WINNER=
0:GOTO 1295
CT 1285 IF SCORE(0)=SCORE(1) THEN 1297
WM 1290 WINNER=1
YF 1295 POSITION 2,6:?:#6;"Player #";WINN
ER+1:" Wins!":GOTO 1298
LJ 1297 POSITION 5,6:?:#6;"it's a tie!"
RY 1298 FOR I=50 TO 250 STEP 3:POKE 540,0
:GOSUB 40:SOUND 0,I,10,6:SOUND 1,300-I
,10,6:NEXT I:GOSUB 2700:GOTO 1500
OC 1300 GOSUB 4000:GOSUB 2000:GOSUB 2500:
ROUND=ROUND+1:POKE 87,1:POSITION 13-1*(
ROUND>9),13:?:#6:ROUND:;GOSUB 2600
ZA 1340 GOTO 1000:REM ** start next round
**

```

continued on next page

```

0270 STA $47 ; LO BYTE LOWER CASE
0280 SEC
0290 LDA $59 ; PAGE # SCREEN MEMORY
0300 SBC #1
0310 STA $48 ; PAGE # LOWER CASE
0320 SBC #1
0330 STA $CF ; PAGE # CONTROL CHARS
0340 SBC #1
0350 STA $CD ; PAGE # CAPS
0360 SBC #1
0370 STA $46 ; PAGE # NUMBERS
0380 LDY #0 ; SET COUNTER
0390 ; BEGIN SPREADING LETTERS,
0400 ; ONE BYTE AT A TIME
0410 START LDA $E000,Y ; COPY NUMBERS
0420 STA ($NUMBERS),Y ; STORE THEM
0430 LDA $E100,Y ; COPY CAPS
0440 STA ($CAPS),Y ; STORE UNCHANGED
0450 STA ONECHAR ; MAKE EXTRA COPY
0460 LSR A ; SHIFT LEFT
0470 LSR A ; NYBBLE INTO
0480 LSR A ; RIGHT NYBBLE, LEAVING
0490 LSR A ; LEFT NYBBLE EMPTY
0500 STA HALFCHAR ; FILE IT AWAY
0510 LDA ONECHAR ; THAT EXTRA COPY
0520 AND #$0F ; KILL LEFT NYBBLE
0530 JSR BIT3 ; SPREAD RIGHT NYBBLE
0540 STA ($CONTROL),Y ; STORE RIGHT
0550 ; HALF OF NEW LETTER
0560 LDA HALFCHAR ; GET OTHER HALF
0570 JSR BIT3 ; SPREAD IT
0580 STA ($LOWER),Y ; STORE LEFT HALF
0590 INY ; COUNTER = COUNTER +1
0600 CPY #26*8 ; 8 BYTES TO A LETTER
0610 ; 26 LETTERS TO AN ALPHABET
0620 BNE START ; NEXT Y
0630 FINISH LDA $E000,Y ; STORE
0640 STA ($NUMBERS),Y ; MISC.
0650 LDA $E100,Y ; CHARACTERS
0660 STA ($CAPS),Y ; UNCHANGED
0670 LDA $E200,Y
0680 STA ($CONTROL),Y
0690 LDA $E300,Y
0700 STA ($LOWER),Y
0710 INY
0720 CPY #$FF ; DONE
0730 BNE FINISH
0740 LDA $46 ; FIRST PAGE # NEW SET
0750 STA CHBAS ; POKED INTO POINTER
0760 RTS ; RETURN TO BASIC, BYE BYE
0770 ;
0780 ; SUBROUTINE TO SPREAD HALF
0790 ; A BITE INTO THE FULL BYTE
0800 ;
0810 BIT3 TAX ; SAVE A COPY
0820 AND #8 ; SEE IF BIT 3 IS ON
0830 CMP #8 ; 00001000
0840 BNE BIT2; IF NOT GOTO BIT2
0850 TXA ; GET THE COPY
0860 CLC ;
0870 ADC #$B8; BIT 3 OFF, 6 & 7 ON
0880 ; 11000000
0890 JMP CLR2 ; BYPASS NEXT LINE
0900 BIT2 TXA ; GET UNALTERED COPY
0910 CLR2 TAX ; STASH LATEST VERSION
0920 AND #4 ; SEE IF BIT 2 IS ON
0930 CMP #4 ; 00000100
0940 BNE BIT1; IF NOT, THEN BIT1
0950 TXA
0960 CLC
0970 ADC #$2C ; IF SO, DO THIS
0980 JMP CLR1; 00110000
0990 BIT1 TXA
1000 CLR1 TAX
1010 AND #2 ; BIT 1?
1020 CMP #2 ; 00000010
1030 BNE BIT0

```

```

1040 TXA
1050 CLC
1060 ADC #$0A ; BECOMES
1070 JMP CLR0 ; 00001100
1080 BIT0 TXA
1090 CLR0 TAX
1100 AND #1 ; 00000001
1110 CMP #1
1120 BNE BIT86
1130 TXA
1140 CLC
1150 ADC #$02 ; 00000011
1160 JMP CLR86
1170 BIT86 TXA
1180 CLR86 RTS ; RETURN

```

LISTING 3

```

HE 10 REM PEEKER
YY 20 REM BY BILL MORRIS
RH 30 REM ANTIC MAGAZINE
BX 40 X=20010:REM DATA STATEMENTS WILL ST
ART WITH THIS LINE NUMBER
NM 50 FOR A=1536 TO 1701 STEP 6
DX 60 ? CHR$(125):POSITION 2,6
VE 70 ? X;" DATA "
SD 80 ? PEEK(A);";"
FJ 90 ? PEEK(A+1);";"
TH 100 ? PEEK(A+2);";"
TX 110 ? PEEK(A+3);";"
UN 120 ? PEEK(A+4);";"
RX 130 ? PEEK(A+5)
GU 140 POSITION 2,0:POKE 842,13:POSITION
2,7:?"CONT"
FX 150 POSITION 2,4:STOP
MM 160 POKE 842,12
PY 170 X=X+10
DF 180 NEXT A
OI 190 END

```

End Program Typing Agony Forever!

Antic Magazine+Disk Subscription

Instant Relief!

Only \$99.95

for 12 issues.

See Subscription

Insert for details.



○ TOUCH TABLET CURSOR

Article on page 36.

LISTING 1

```

YU 10 REM KOALA CURSOR DEMONSTRATION
BX 20 REM BY KARL E. WIEGERS
RH 30 REM ANTIC MAGAZINE
EH 40 AD=1593:REM AD=1596 FOR ATARI TOUCH
    TABLET.
DZ 50 DATA 104,169,7,162,6,160,10,76,92,2
    28,173,112,2,141,0,208,160
MA 60 DATA 6,169,0,145,205,136,16,251,173
    ,113,2,133,205,160,0,177,203
AL 70 REM 60 DATA 6,169,0,145,205,136,16,
    251,169,228,56,237,113,2,133,205,160,0
    ,177,203
IR 80 REM FOR TOUCH TABLET. USE THE ABOVE
    DATA LINE IN PLACE OF LINE 60.
VE 90 DATA 145,205,200,192,7,208,247,165,
    28,201,4,208,7,206,192,2,169
IT 100 DATA 0,133,20,76,98,228,104,160,98
    ,162,228,169,7,76,92,228
RR 110 REM RESERVE 8 PAGES OF RAM FOR PM
    GRAPHICS
BY 120 RAMTOP=PEEK(106)-8
HM 130 PMBASE=RAMTOP*256
OH 140 POKE 106, RAMTOP-4
YX 150 GRAPHICS 17
MS 160 POKE 54279, RAMTOP
LR 170 POKE 559, 0
DX 180 REM LOAD VERTICAL BLANK INTERRUPT
    ROUTINE INTO PAGE 6
KN 190 FOR I=1 TO (AD-1526):READ A:POKE 1
    535+I,A:NEXT I
FD 200 FOR I=PMBASE+1024 TO PMBASE+1279:P
    OKE I,0:NEXT I
SV 210 POKE 203,0:POKE 204, RAMTOP
GW 220 POKE 205,0:POKE 206, RAMTOP+4
RV 230 REM LOAD PLAYER DATA
YL 240 FOR I=0 TO 6:READ A:POKE PMBASE+I,
    A:NEXT I
VC 250 DATA 128,64,32,20,12,30,6
ZA 260 GRAPHICS 17
HM 270 POSITION 4,1:?:#6;"*** MENU ***"
JK 280 POSITION 5,5:?:#6;"menu item 1"
WM 290 POSITION 5,7:?:#6;"menu item 2"
IR 300 POSITION 5,9:?:#6;"MENU ITEM 3"
CJ 310 POSITION 8,11:?:#6;"QUIT"
BV 320 REM TURN ON PMG AND INITIALIZE TIM
    ER
RN 330 POKE 559,62
VM 340 POKE 53277,3
EM 350 POKE 20,0
AD 360 REM TURN ON VBI ROUTINE. TO TURN I
    T OFF, USE A=USR(AD)
YW 370 A=USR(1536)
OZ 380 FOR I=1 TO 100:NEXT I
EA 390 IF STICK(0)=15 THEN 390
NZ 400 IF PEEK(205)>63 AND PEEK(205)<74 T
    HEN GOTO 450
MM 410 IF PEEK(205)>79 AND PEEK(205)<90 T
    HEN GOTO 520
TS 420 IF PEEK(205)>95 AND PEEK(205)<106
    THEN GOTO 680
KK 430 IF PEEK(205)>111 AND PEEK(205)<122
    THEN GOTO 750

```

```

QG 440 GOTO 390
VH 450 GRAPHICS 18:POKE 559,62:POKE 53248
    ,0
GU 460 A=USR(AD)
PW 470 POSITION 4,3:?:#6;"AT OPTION ONE"
CQ 480 POSITION 2,7:?:#6;"PRESS BUTTON FO
    R":?:#6;"           MENU"
PC 490 FOR I=1 TO 100:NEXT I
WI 500 IF STICK(0)=15 THEN 500
OK 510 GOTO 260
PI 520 GRAPHICS 2:POKE 559,62:POKE 752,1
LV 530 POKE 708,88:POKE 709,0:POKE 710,19
    8
RZ 540 POSITION 6,2:?:#6;"7 + 5 = ?"
FA 550 POSITION 4,6:?:#6;"10 12 2 16"
XU 560 ? " Point to answer and press butt
    on"
DW 570 IF STICK(0)=15 THEN 570
QL 580 LM=16050-10*AD
RF 590 IF PEEK(625) < LM OR PEEK(625) > LM+17
    THEN 570
PG 600 IF PEEK(624)>99 AND PEEK(624)<121
    THEN GOTO 620:REM PADDLE(0)
WP 610 POSITION 3,0:?:#6;"SORRY-TRY AGAIN
    ":FOR I=1 TO 50:NEXT I:GOTO 570
UV 620 POSITION 3,0:?:#6;"     CORRECT!!
    "
RM 630 POSITION 14,2:?:#6;"12"
WJ 640 ? "K ... PRESS BUTTON FOR MENU"
OW 650 FOR I=1 TO 100:NEXT I
DU 660 IF STICK(0)=15 THEN 660
OX 670 GOTO 260
VP 680 GRAPHICS 18:POKE 559,62:POKE 53248
    ,0
HC 690 A=USR(AD)
ZA 700 POSITION 3,3:?:#6;"AT OPTION THREE
    "
CF 710 POSITION 2,7:?:#6;"PRESS BUTTON FO
    R":?:#6;"           MENU"
OR 720 FOR I=1 TO 100:NEXT I
BO 730 IF STICK(0)=15 THEN 730
OS 740 GOTO 260
DZ 750 POKE 53248,0:A=USR(AD)
XK 760 POKE 106,PEEK(106)+12
ZK 770 POKE 559,3:GRAPHICS 0:END

```

End Program Typing Agony Forever!

Antic Magazine+
Disk Subscription

Instant Relief!
Only \$99.95
for 12 issues.



See Subscription
Insert for details.

DISKIO

Article on page 40.

LISTING 1

```

OL 1 REM DISKIO VERSION 4.3 -- BY BERNARD
OPPENHEIM. ANTIC, JANUARY, 1985. PUB
LIC DOMAIN. REQUIRES DOS 2.05.
HN 2 DIM DATS(114),CHS(2):K32=32768:IF PE
EK(1693)=255 THEN 10
EN 3 FOR I=1 TO 158:READ X:POKE 1535+I,X:
NEXT I
NU 4 DATA 104,104,104,133,205,104,104,170
,104,133,204,104,133,203,24,165,203,10
1,205,133,203,144,2,230,204,160
NC 5 DATA 0,177,203,133,212,200,177,203,1
33,213,48,72,232,228,212,240,10,134,21
2,165,213,9,128,133,213,208,57
KS 6 DATA 200,177,203,133,205,56,233,3,13
3,206,169,0,168,74,144,2,9,128,81,203,
208,196,206,144,244,133,207,74,74
QO 7 DATA 74,74,201,10,144,3,24,105,7,105
,48,209,203,208,13,200,200,196,205,240
,167,136,165,207,41,15,16,230,96
XL 8 DATA 104,104,133,204,104,133,203,160
,0,132,213,177,203,56,233,48,201,10,14
4,2,233,7,10,10,10,133,212
PT 9 DATA 200,177,203,56,233,48,201,10,14
4,2,233,7,24,101,212,133,212,96,0
PJ 10 GOSUB 19:LN=USR(1536,LEN0,LINE0,ADR
0):IF LN<K32 THEN POKE 1693,255:LIST L
N:END
ZK 11 IF LN>K32 THEN POKE 1693,255:LN=LN-
K32:?"LINE ";LN;" IS MISSING":END
BM 12 ? "READY TO CREATE AUTORUN.SYS FILE
?":CLOSE #1:OPEN #1,4,0,"K":GET #1,X
:IF X<>89 THEN END
RW 13 CLOSE #1:OPEN #1,8,0,"D:AUTORUN.SYS
":RESTORE 20:CHADR=ADR(CHS):TRAP 18
QD 14 READ DATS:L=LEN(DATS)-2:IF ASC(DATS
)>47 THEN IF ASC(DATS)<?1 THEN 1?
GQ 15 FOR I=1 TO L:CHS=DATS(I):X=ASC(CHS)
:IF X=33 THEN X=155
X0 16 PUT #1,X:NEXT I:GOTO 14
BZ 17 FOR I=1 TO L STEP 2:CHS=DATS(I):X=U
SR(1647,CHADR):PUT #1,X:NEXT I:GOTO 14
YK 18 CLOSE #1:END
VS 19 ADR0=PEEK(138)+256*PEEK(139):LINE0=
PEEK(ADR0):LEN0=PEEK(ADR0+2):RETURN
WQ 20 DATA FFFF0C1D342968AD01A0C9CAF009C9
08D06EA9238DF71DA50C8D4A1EA50D8D4B49
MQ 21 DATA 1EA949850CA91E850DA9F9A2262861
26A02488888B91A03C945D0F6B91B03856A
TD 22 DATA CBA9FC991B03B91C0385CCA91C991C
03A00FB1CB99FC1C8810F8A9868D001DA91E
WH 23 DATA 1D8D011D18A004B1CB69018D881DC8
B1CB69008D891DA9358DE702A9298DE802EC
RU 24 DATA 60203EF608C99BF005EEF91D286098
488A48A206B5CB48CA10FAADF91DF0378516
KU 25 DATA CDA9008DF91D85D08DFE02ADF202F0
26BAADF61DD0038EF61DEC61DD075A96493
SI 26 DATA 85CBA91E85CCD00320FB1DA0FFC8C4
CDF0F6B1CBC9FFF05B297FD98005D0E9810D
IR 27 DATA CB10EAC884CEB1CB48C8B1CB486000
0000223100C8B1CB10FB981869034C3D2282
FF 28 DATA A00084D0A92E998005C884CD84CEA9
22CDF71DF008A95585CBA91E85CC4CA52073
OS 29 DATA A5D0D0DCA9801865CD8524A9058525
A9058522A2F96895D2E830FA68AA68A8A9AA
LZ 30 DATA 9B286020401520271DA9008DF91D60
FF585846494E442F4026252FB11E254449B6
AK 31 DATA D21F362EC4216344454CAE20A44445
4C4554C520712ECB21654C4F43CB20752E6B
WW 32 DATA D52165554EAE20A4554E4C4F43CB20
792ECE21635245AE20A452454E414DC52015
TF 33 DATA 7D4B494CCC20972EC5216545AE20A4
454E5445D220E32ECC21654C4FAE20A44CAF
QA 34 DATA 4F41C420E32ED2216552554EC4215A
2ED3216353AE20A4534156C520E32ED82166
SK 35 DATA 634C49AE20A44C495354C4215A4CAE
20A44C4953D41E252EC22165424CAE20A4D0
QH 36 DATA 424C4F41C4260648454CD02683464F
524D41D425192ECD21634DAE20A44D4F565B
DM 37 DATA C523E657444FD3249EFF4313A2A2E
2A9B20B419A9028552A931A004C4CDD003DA
SR 38 DATA AD83058DF81D8D311FA006A93048A9
1F48A98320D6259810034CBC23206722A93B
NK 39 DATA 008DEE0585D1A97D8DC605A91D8DC7
05A99B8DC805A9C648A90548A028A909A2A9
AO 40 DATA 0020D625ADEE05D010A91C8DC6058D
C705A99B8DC8052056E4207C22A220F81878
CO 41 DATA A5D1690185D1D82901F00AA9C685CB
A90585CCD008A9D85CBA90585CCA5CB48BF
AL 42 DATA A5CC48A014A90520D62598100620B4
194C061EEEE05A00DA920D1CBD0072EEEBC
DY 43 DATA 05A01288B1CBC891CB88D0F7C8B1CB
C891CBA800A5D129F0D006A92091CBD00968
CV 44 DATA 4A4A4A4A18693091CBC8A5D1290F18
693091CB4A90C6A9208DD80580D9054CA23A
NR 45 DATA 1F202D204C061E8DEF05A4CE20EF20
20C324A5D0F00568684C061EE6CEA220A944
PP 46 DATA 00A4CD9980053898E5CEA818A98065
CE48A905690048ADEF05C903D002A0042052
MK 47 DATA D6259810066868984CBC2360A921D0
B1A923D0ADA924D0A9A4CE20EF202056252C
BD 48 DATA F00530074C061EA920D096A90085D0
4C261EAD4A1E850CAD4B1E850D4C74E4A008
AG 49 DATA 0020FB1DA4CE88B1CB297F998005B1
CB3008C820CB20E6CE10EDC8B1CB48C8B11B
PV 50 DATA CB48A4CE608CF005E6CD4CDB8B980
05998105CCF005D0F4A92099800560A4CEA5
EK 51 DATA 20EF2020C3244C261E203321ADF71D
D98805D013C8C8A93AD98005D002F20CB2030
HD 52 DATA A931998005D02520CB20ADF71D9980
05C820CB20A944998005C820CB20ADF81DC5
DF 53 DATA 998005C820CB20A93A99800560B980
05C920D028C4CDF01C6CD8CF005B9810562
UE 54 DATA 998005C4CDF003C810F3A920998105
ACF00510D960A4CEA920997F05D008E6D008
CW 55 DATA A5CDC902F064AD8205C930305DC93A
105938E920C910D002A9008DF105AD83059A
BB 56 DATA 38E9208DF205C910300AC91A1006A5
CDC903D008BADF1058DF205A9808DF105A560
AY 57 DATA CB48A5CC4838A558E91285CBA559E9
0085CCA015B1CBD005A928203D22A9142014
LA 58 DATA 3D22A001B1CBD0096868A90085D04C
261ECDF205D0E788ADF105297FD1CBD00DDE8
KE 59 DATA C8C8B1CBC900F004C98AD0D1A9208D
81058D082052CF10530038D8305A0012033F9
IL 60 DATA 21A90B203D22A002202D22A92E2047
22A9F8203B22A007202D226885CC6885CB2F
FW 61 DATA A90185CE4CA520B1CBF0062054220
47228810F360C6CC1865C885CB9002E6CC4A
HV 62 DATA 608D80059848A00020CB2068A86048
2A2A2A2A2903AA68299F1D63226020400007
IR 63 DATA 6018A55869168DF505A55969008DF6

```

05A9FF8DF7056020A623EEF705AEF705F035
 UG 64 DATA 0B8EF805CAD006ADEE05F00160A212
 A028208023CEF805F011A028207E23A000A0
 EH 65 DATA 209223A928203D22D0EAA014207E23
 A000209223A212A014209423A003B1CBD031
 DG 66 DATA 034C1F23A902203D2238A5CBE9148D
 F305A5CC90080F405A212A000208823A2E7
 SG 67 DATA 24A02820802302F2320B123A02820
 7E2320A623A0022092230B123A914203D96
 SC 68 DATA 22A224A028209423A212A028208023
 A013B98005F003202F23A027A90091588805
 RA 69 DATA 10FB0A02BA911915860A9008DF90520
 4423ADF905F0016020B12320442360ADF7E5
 FO 70 DATA 058DF805A000207E23A200A012C8E8
 E00CF015B98005DD8005300DF0F0A212A04C
 PW 71 DATA 28209423EEF90560A028209223A9D8
 203B22CEF805D0CD60A200A91280FA05B101
 YB 72 DATA CB9D8005E8C8CEFA05D0F460A200A9
 128DFA05BD800591CBE8C8CEFA05D0F46010
 CU 73 DATA ADF50585CBADF60585CC60ADF30585
 CBADF40585CC6048ADF71DC923F01420B498
 HP 74 DATA 1968A2FF9A85892C41B930034C40B9
 4C34B968A2028E860420E6BD20B4194C06F6
 DM 75 DATA 1EA903202D20A59048A59148A9079D
 420338ADE502E5908DFD05A8ADE602E5913D
 GS 76 DATA 8DFE0520E52598107CC988D0A9BD49
 038DFE05BD48038DFD0520B4194CEA931DB
 AO 77 DATA D98105D02E9498DA926A9A9A22620
 BE19A0FF8FCF02CCFC02F0FBADFC028CFC42
 HL 78 DATA 02A220C93ED00CA9F8DFE02A99D48
 A924D00EA4CEA9319981059818698048A9A3
 BX 79 DATA 0548A008A90320D62598309FA59048
 A59148A90B9D4203ACFD05ADFE0520E5258F
 UT 80 DATA 9830881007A9D0A22620BE1920B419
 A9008DFE024C061E453AA220ADF81D8DBA40
 XR 81 DATA 24A9B948A92448A008A90320D62598
 30B910D944313A44F532E535953A5D00D056
 BC 82 DATA 0160A200A98048A90548A4CDA93F99
 8005C8A90B20D62520B419A004A91848A958
 OH 83 DATA 2548A90320D625A000A91848A92548
 A90720D62585D0A9CFA22620BE1920B41940
 AI 84 DATA A959C5D00D004A90085D0A4CDA92099
 8005604B3AADF81D8D9A26A98E85CBA926C5
 SJ 85 DATA 85CCA000A206208023E6D0A01384CD
 20C324A5D0D017A00D207E23E6D0A00E84EF
 XN 86 DATA CD20C324A5D0D005A9FE4C27204C06
 1EA6CDA0FF8FCF05A92CC8CAF06FD98005DA
 JG 87 DATA D0F7EEFB058888B9800548A94149980
 05B9810548AD8805998105A93A998205E81A
 TZ 88 DATA E8E88E4803984820B4196848186980

488D4403A9006905488D4503A004A9032057
 MC 89 DATA D625C0AAF014EEFB05A90B8D4203A2
 002056E4A9DBA22620BE1920B41968A868AB
 NB 90 DATA 99810568998805A92C998205ADFB05
 609D4203C903D006989D4A831009A9009D22
 EE 91 DATA 4903989D4803688DC505688DC40568
 9D4503689D4403ADC40548ADC505484C568C
 ZL 92 DATA E4A4CE20EF20A210A9008D9E1518A9
 8165CE9D4403A90569090D4503A4CDB97E8B
 PQ 93 DATA 05C92FD00E6CDC6CDCB97F05C94ED0
 03CE9E15A4CDA99B99800520A415E000005A
 VB 94 DATA 034C061EE003F00620AA194C8C23A9
 EBA22620BE1920AA194C061E85CB86CCA50B
 CT 95 DATA CBA6CC20BE19A0FF08C8B1CBF00E28
 F0EEC99B08E6CDCB002E6CDC0EE2860A93F90
 IF 96 DATA A2272061264C061E2044FF
 YJ 97 DATA ISKIO 4.3 by Bernard Oppenhei
 M!Antic 1/8! Type HELP for commands! CA
 FA 101 DATA 007D4313
 JF 102 DATA OMMANDS:!! DIR Directory!
 DIRn Dir. Drive n!
 FORMAT Format disk! 62
 EP 103 DATA WDDOS Write DOS.SYS!.X->LI.->LISTD List to disk!.S->S. ->SAVE S
 ave to disk!.E->E. ->ENTER EF1
 SF 104 DATA Oter to mem.!L->LO.->LOAD
 Load to mem.!R-> RUND Run disk
 file!.K-> LOCK Lock file!.EB
 MB 105 DATA U->UN.->UNLOCK Unlock file!.N
 ->RE.->RENAM Rename file!.D->DEL.>DEL
 ETE Delete file!.B->BL.->BLOAD BiF4
 OD 106 DATA nary load!.M->M. ->MOVE Mov
 e file!.R9 runs #9 etc. To use DOS ty
 pe KILL.Reboot to restore DISKIO.!24
 MW 107 DATA 00E202E3020D1D47

INFO BITS

See Help.

LISTING 2

```
10 : LISTING 2
15 : INFOBITS.ASM
30 ICCOM = $0342
40 ICBAL = $0344
50 ICBAH = $0345
60 ICBLL = $0348
70 ICBLH = $0349
80 CI0V = $E456
90 PUTREC = $09
0100 GETREC = $05
0110 ROWCUR = $54
0120 CH = $02FC
```

```
0130 EOL = $9B
0140 RBLL = $0358
0150 SBUFL = $E0
0160 SBUFH = $E1
0170 SBLL = $E2
0180 R = $E3
0190 RBUF = $03FD
0200 *= $0600
0210 PLA
0220 PLA
0230 STA SBUFH
```

continued on next page

```

0240 PLA
0250 STA SBUFL
0260 PLA
0270 PLA
0280 STA SBLL
0290 ;
0300 GET LDX #$10
0310 LDA #GETREC
0320 STA ICCOM,X
0330 LDA #RBUF&SFF
0340 STA ICBAL,X
0350 LDA #RBUF/256
0360 STA ICBAH,X
0361 LDA #131
0363 STA ICBLH,X
0365 LDA #0
0367 STA ICBLH,X
0370 JSR CIOV
0380 BMI END
0390 ;
0400 LDX #0
0420 LDY #0
0450 P1 LDA RBUF,X
0460 P2 CMP (SBUFL),Y
0470 BEQ P3
0480 CPY #0
0490 BEQ P4
0500 LDY #0
0505 LDX R
0510 JMP P4
0520 P3 INY
0530 CPY SBLL
0540 BCS PRINT
0560 P4 INX
0570 CPX RBLL
0580 BCS GET
0585 CPY #0
0590 BNE P1
0595 STX R
0600 JMP P1
0610 ;
0620 END RTS
0630 ;

```

```

0800 PRINT LDX #$20
0810 LDA #PUTREC
0820 STA ICCOM,X
0830 LDA #131
0840 STA ICBLL,X
0850 LDA #0
0860 STA ICBLH,X
0870 ;
0880 LDA ROWCUR
0890 CMP #20
0900 BCS PROMPT
0910 ;
0920 LDA #RBUF+$0A&SFF
0930 STA ICBAL,X
0940 LDA #RBUF+$0A/256
0950 STA ICBAH,X
0970 JSR CIOV
0980 JMP GET
0990 ;
1000 PROMPT LDA #MESSAGE&SFF
1010 STA ICBAL,X
1020 LDA #MESSAGE/256
1030 STA ICBAH,X
1040 JSR CIOV
1050 WAIT LDA CH
1060 CMP #255
1070 BEQ WAIT
1072 LDA #255
1074 STA CH
1080 LDA #CLEAR&SFF
1090 STA ICBAL,X
1100 LDA #CLEAR/256
1110 STA ICBAH,X
1120 LDA #5
1130 STA ICBLH,X
1140 LDA #0
1150 STA ICBLH,X
1160 JSR CIOV
1170 JMP PRINT
2000 ;
2010 MESSAGE .BYTE "ANY KEY",EOL
2015 CLEAR .BYTE "K",EOL

```

TECH TIPS

This routine zeroes-out 256 bytes of RAM starting at decimal address ADDRESS:

```

RA 30 ZER=ADR("hh:hh:hh:hh:hh:hh:hh:hh")
HR 40 REM X=USR(ZER,ADDRESS) Zeroes-out
256 bytes of RAM.

```

This routine performs a double PEEK at decimal address ADDRESS and ADDRESS+1. It's equivalent to: X=PEEK(ADDRESS)+PEEK(ADDRESS+1)*256

```

RA 50 DBPK=ADR("hh:hh:hh:hh:hh:hh:hh:hh")
HT 60 REM X=USR(DBPK,ADDRESS). Does a do
uble PEEK at address and address+1.

```

Move NUM bytes from decimal address FROM to address TOO with this handy routine:

```

PY 70 SHIFT=ADR("hh:hh:hh:hh:hh:hh:hh:hh")
ICP FUFPP (F9F0P.JFO+I+)
CJ 80 REM X=USR(SHIFT, FROM, TOO, NUM) Move
5 NUM bytes from memory location FROM
CO 90 REM to location TOO.

```

POKE 580,1 causes a coldstart when the [RESET] key is pressed. POKE 580,255 returns the [RESET] key to its normal state.

This is a timer routine that will make the computer wait JIFF jiffies:

```

PC 100 JIFF=ADR("hh:hh:hh:hh:hh:hh:hh:hh")
IL 110 REM X=USR(JIFF,JIFFIES) Waits JIF
FIES

```

This statement quickly fills a string with blanks:

```

WP 120 DIM NS(100)
GK 130 NS(1)=" ":"NS(100)=NS:NS(2)=NS
VS 140 REM Quickly fills a string with bl
anks.

```

NOTE: USR routines are REMmed to guide against potential lock-up. Remove REMs before RUNning.

POKE 65,0 shuts off the beeping you hear during cassette and disk I/O. POKE 65,3 turns it back on again.

POKE 77,129 immediately starts the attract mode.

Send your output to the printer instead of the screen with POKE 838,166:POKE 839,238. Then POKE 838,163:POKE 839,246 sends your output back to the screen.

NEW BOOKS FOR ATARI

Roundup of the Latest Releases

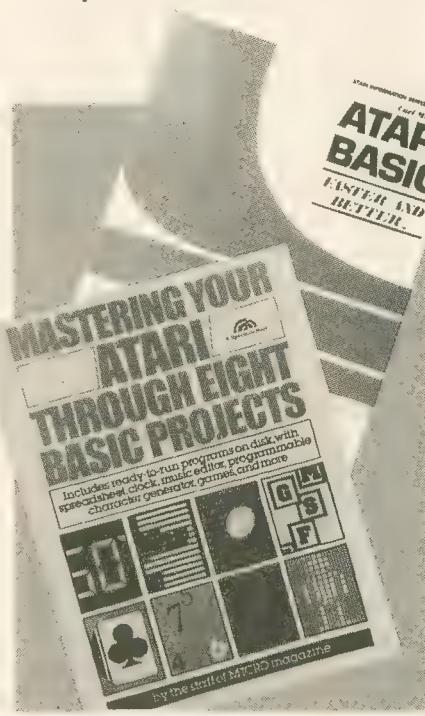
by THE ANTIC STAFF

Mastering Your ATARI Through Eight BASIC Projects, edited by Tom Marshall, comes with a disk containing the 13 programs discussed in the book. These programs range from games and music generators to timers and micro-calculators. Every chapter uses one or two of these programs to demonstrate important programming concepts. Unfortunately in many instances, the editor refers to tables and illustrations which do not exist, and asks you to recall facts from chapters appearing much later in the book.

\$19.95. 174 pages. Prentice-Hall, Inc., 200 Old Tappan, Old Tappan, NJ 07675, (201) 767-5000.

Basic ATARI BASIC, by James S. Coan and Richard Kushner, takes you from an introduction to the PRINT statement to an analysis of Player-Missile Graphics. Beginning programmers should regard this book as a reference tool, rather than a tutorial. It is not easy reading, but the ideas and concepts presented are excellent. The "Bugs in Atari BASIC," section outlines many ways to overcome the language's limitations. Another section examines the special features of the XL Computers, such as enabling fine scrolling through a single POKE statement.

\$15.95. 324 pages. Hayden Book Company, 50 Essex Street, Rochelle Park, NJ 07662, (800) 631-0856.



Carl M. Evans's **ATARI BASIC—Faster and Better** shows you how to improve your BASIC programs with machine-language subroutines. The book contains listings and descriptions of more than 80 subroutines, including routines which can make your program unlistable, analyze your program's variables, generate AUTO-RUN.SYS files and create scrolling screen displays. You don't need to know any machine language to use this book; Evans has translated each assembly listing into DATA statements to use in your BASIC programs.

\$16.95. 300 pages. IJG, Inc. From Antic, 524 Second Street, San Francisco, CA 94107, (415) 957-0886.

Advanced Programming Techniques for your Atari Including Graphics & Voice Programs, by Linda M. Schreiber, will help you master scrolling, page-flipping, and several other important programming techniques. The book's most helpful chapter, "Working with the Display List," shows you how to create and manipulate customized graphics. The book is easy to read and contains more than 50 type-in programs, including a character set editor.

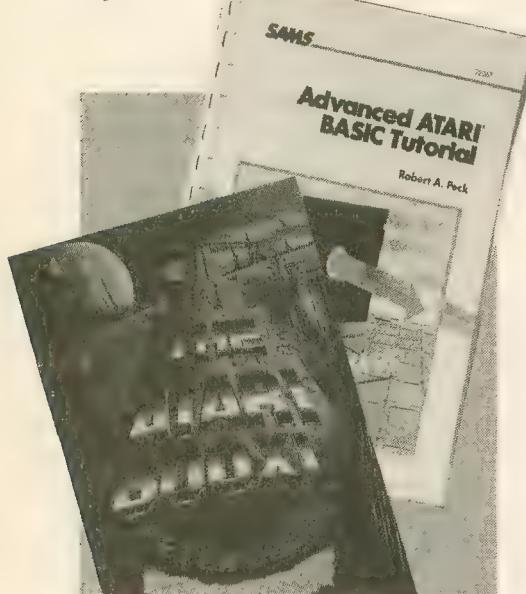
\$14.50. 207 pages. TAB Books Inc., Monterey Avenue, P.O. Box 40, Blue Ridge Summit, PA 17214, (717) 794-2191.

continued on next page



101 Programming Surprises & Tricks for your ATARI Computer, by David L. Heiserman, should provide about 30 minutes of pointless entertainment and frustration for a bored eight-year-old. The book is a disappointing collection of 101 "mystery" programs. You type them in and see what they do. There are calendars, quizzes, mock weather predictions, games. Only some games are programmed to cheat, and there are other "practical joke" programs scattered throughout the book.

\$11.50. 196 pages. TAB Books Inc., Monterey Avenue, P.O. Box 40, Blue Ridge Summit, PA 17214, (717) 794-2191.



Robert A. Peck's **Advanced Atari BASIC Tutorial**, is a solid sequel to the **ATARI BASIC Tutorial**. It offers clear and comprehensive descriptions of advanced programming techniques such as string manipulation, disk operations and sorting techniques. Featured is a screen builder program to help you create and save your own graphics screens.

\$11.95. 174 pages. Howard W. Sams & Co., Inc., 300 West 62nd Street, P.O. Box 7092, Indianapolis, IN 46206, (317) 298-5400.

How to Get the Most Out of CompuServe, by Charles Bower and Davia Peyton. If you got a CompuServe Starter Kit as a present, or if you're just thinking about maybe becoming a subscriber to this tele-

communications information service, get this book. It presents a series of "guided tours" through CompuServe's many layers of menus and commands. The tutorial will save you from wasting considerable time and money as you get familiar with moving around Compuserve.

\$14.95. 275 pages. Bantam Books, 666 Fifth Avenue, New York, NY 10103. (212) 765-6500.

The Coming Computer Industry Shakeout: Winners, Losers & Survivors, by Stephen McClellan. The author is a leading computer stock analyst whose purpose here was to counsel on which high-tech companies to buy shares in and which to avoid. But the book also gives a startlingly frank, no-holds-barred critique of the good points and bad points of just about every important computer-related company. You'll get a kick out of this if you're interested in the computer industry as a whole.

\$19.95. 349 pages. Wiley & Sons, 605 Third Avenue, New York, NY 10158. (212) 850-6500.

BASIC on the Atari Computer for Kids, by Keith and Cherie Wyner, will give you a clear, simple and thorough introduction to BASIC programming. The text and examples are written at a fifth-grade level, but adults willing to study a "kiddie" textbook can expect to learn a good amount of BASIC in very little time.

\$12.95. 213 pages. Howard W. Sams & Co., Inc., 4300 West 62nd Street, P.O. Box 7092, Indianapolis, IN, 46206, (317) 298-5400.

Getting Started with Your ATARI 600XL and The Atari 600XL Program Book, by Peter Goode, will help you get the most out of your XL. The Program Book is filled with well-documented type-in games, music programs, and Biorhythm graphings. Just remember that these books were originally published in Great Britain, so the listings substitute the "Pound" sign for our number sign (#).

12.95 each. 150 pages. David & Charles, Inc., Box 57, North Pomfret, VT 05053. (802) 457-1911

Kids And The Atari by Edward Carlson is an excellent choice for adult beginners too, despite its title. Chock-full of brief BASIC samples and clever illustrations, the book is spiral bound for easier program typing. The writing is clear and conversational as it covers the fundamentals of BASIC.

\$19.95. 219 pages. Datamost. From Antic, 524 Second Street, San Francisco, CA 94107. (415) 957-0886.

The Musical Atari by Hal Glicksman simultaneously teaches you music and BASIC programming for the Atari's four voices. The book features 29 songs arranged for piano and Atari duets, plus a line-up of sound effects routines. Includes programs for turning the Atari keyboard into a piano or chord organ.

\$14.95. 167 pages. Datamost. From Antic, 524 Second Street, San Francisco, CA 94107. (415) 957-0886.



RESTON'S CREATIVE PASTIMES

The best way for most people to learn BASIC is by typing in short programs and experimenting with them. If the programs are accompanied by text that explains them and gives suggestions for alterations, so much the better.

Enter Creative Pastimes, a new series of \$6.95 spiral-bound books for beginners from Reston Publishing.

Homework Helper, at 149 pages the largest of the series, presents programs for memory skills, spelling and word problems, and history. The "Computer As A Tool" section gives

you programs for using your Atari as a calculator, to paint, plot bar graphs, sort lists, and to learn number systems.

The programs are presented in fully-explained modules, with instructions on how to combine modules for a larger, more powerful program. The book appears to be a translation for the Atari from a version written for some other computer. So it includes a few commands which simply don't work.

The Code Breakers (subtitled An Atari Adventure) contains a book-length narrative. Nikki and Adam are a teenage brother-and-sister detective team on the trail of a mystery. Using their computer, they decode clues with your help.

There are only seven short programs in the 75-page book, and none is well explained. However, as an interactive story-program for youngsters, "The Code Breakers" appears to have good entertainment value.

Once the first thrill of novelty has worn off, **41 1/2 Fun Projects For Your Atari** promises to get you interested in playing with your computer again. There's a wide range of programs here, with a solid emphasis on puzzles. In addition, there are plenty of suggestions for modifying the programs to suit your requirements.

The first section, "Word Play," presents the familiar word-search puzzle, word and sentence-scrambling programs. "IQ Building" consists primarily of memory exercises, including a concentration-type game. "Strategy Puzzles" contains the star program of the book, an ancient Japanese game called Dozo with a skillful computer opponent. This game alone is probably worth the price.

The "Music and Noise" section takes advantage of Atari's flexible music-generation capabilities, including a program for tuning guitars and one for tutoring guitar. Finally, "Computer Utilities" provides programs such as "A Calculator Utility," "Decimal/Hex/Binary Conversion," and believe it or not, "A Computer Dating Service"! An appendix accounts for the title's "1/2," and gives

12 suggestions for modifying the book's programs or creating your own.

Atari Puzzlements is an interesting experiment. It seems to be intended more for the confirmed debugger than for those who are just learning about BASIC. The book is packed full with very short routines, each of which contains an error of some sort. A line may be scrambled or missing, or program lines may be in the wrong order, or there just might be a tiny mistake in one of the lines. The book's idea is to make you aware of the types of mistakes you make as a beginner, so you'll become more adept at tracking down and solving them. The quality is slightly marred by misleading instructions.

Creative Pastimes has a subcategory of books entitled "Itty Bitty Bytes". Intended for children from ages 6-9, the series attempts to capture children's interest with graphics and sound while teaching them about programming.

All books use the simple, straight-

forward approach of presenting a short program on one page, with a line-by-line explanation of the program (take-apart) on the facing page. In most cases, it will be necessary for parents to help their children type in and use the programs.

Itty Bitty Bytes of Space programs include "Gravity," "Music from Mother Earth," and "Meteors," a simple game. Some **School Days** programs include "Spelling Counts!," "State the States," and the intriguing "Gag Me With a Spoon," which lets you vent your frustration with the school cafeteria. **Matilda, the Computer Cat** contains "Fleas!," "Nine Lives," and "In the Kitty."

As inexpensive introductions to BASIC programming, the Creative Pastimes series succeeds. Most of the books provide good value and should keep young computerists occupied for hours with a minimum of frustration.

\$6.95 each. Reston Publishing
11480 Sunset Hills Road, Reston, VA
22090. (800) 336-0338

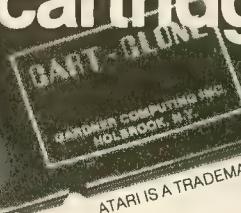


Copy any Atari™ cartridge



CART CLONE™

A must for all Atari users. **CART CLONE** will backup and transfer any 8 or 16K cartridge to disk or tape. The contents of the cartridge will become a file which you can transfer, rename or delete. They will execute from DOS. No need to run a special menu or program to run these files.



Will it copy any cartridge?

The answer is YES.

What will I get?

The answer is a cartridge containing the hardware required and a disk with the cloner software in a powerful machine language program.

For a limited time only you can get **CART CLONE** with software for

\$59.95 plus 2.50 Shipping

Ultima Electronics, Ltd.

21 Central Drive
Farmingdale, New York 11735

Toll Free: 800-645-9607

We accept C.O.D. orders, money orders and ship within 24 hours. Personal checks must clear before shipping.

We also accept VISA and American Express.

CART CLONE goes in the left cartridge slot enabling it to work in all ATARI Home Computers including the XL series

Antic® BOOKSTORE

BEST OF ANTIC ANTHOLOGY

\$12.95
\$24.95

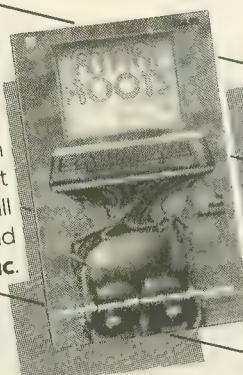
998 pages of the finest material from Antic's first year (original magazines out of print). You get 31 terrific programs—utilities, applications and tutorials. 10 games including 6 never published anywhere else. NO typing when you order Book+Disk!



ATARI ROOTS

\$14.95

Beginner's best guide to Atari assembly language programming. Clear, understandable 288-page introduction to the fastest, most memory-efficient programming language. Takes you all the way through advanced sound and graphics. As excerpted in Antic.



KIDS AND THE ATARI

\$19.95

Best-selling starter book for new Atari BASIC programmers. Great for adults as well as kids. The book that got thousands off and running. 219 large-format pages and clever illustrations.



ATARI BASIC, FASTER AND BETTER

\$15.95
\$29.95

+2 DOUBLE DISKS
By Carl Evans,
Antic Contributing Editor

Over 80 BASIC and machine language routines, handlers and program shells. 300 pages of powerful ready-made programming solutions and tips. No typing with Book+2 Double Disks.



THE MUSICAL ATARI

\$14.95

Learn music and BASIC at the same time in this 167-page guide to Atari 4-voice sound programming. Converts your keyboard to a piano or chord organ. Includes 29 favorite songs arranged for piano or Atari—plus library of sound effect routines.



Best of Antic Anthology

<input type="checkbox"/> Book only:	\$12.95	<input type="checkbox"/> Book Only:	\$15.95
<input type="checkbox"/> Book+Disk:	\$24.95	<input type="checkbox"/> +2 Double Disks:	\$29.95
<input type="checkbox"/> Atari Roots	\$14.95	<input type="checkbox"/> The Musical Atari	\$14.95
<input type="checkbox"/> Kids and the Atari	\$19.95		

Atari BASIC, Faster and Better

<input type="checkbox"/> Book Only:	\$15.95
<input type="checkbox"/> +2 Double Disks:	\$29.95
<input type="checkbox"/> The Musical Atari	\$14.95

Check Or Money Order Enclosed

Charge To My: Visa Mastercard

Account # _____ Expiration Date _____

CARDHOLDER: Name _____ Please print

Signature _____

Phone toll-free 24 hours daily for instant credit card orders:

(800) 227-1617, ext. 133. In California (800) 772-3545, ext. 133.

Add \$2 per book for shipping and handling. Total \$ _____

Name _____ Please print

Address _____

City/State/Zip _____

Allow 8 weeks for delivery

Mail Today To: Antic Publishing, 524 Second Street, San Francisco, CA 94107.

OP CODE FINDER

Simplifying machine code analysis

by DONNY CHERF

Opcode Finder is a chart that conveniently brings together the symbols for all three formats of representing machine language subroutines in BASIC programs. This information makes it a lot simpler to hand-disassemble short subroutines for study or modification.

Once you understand the fundamentals of assembly language programming, a good way to improve your skills is by analyzing existing programs. You can find machine language subroutines in many of the BASIC programs published in *Antic*. To learn how the machine language is being used in the program, you can disassemble these subroutines (convert them back to assembly language).

This job becomes a little harder because there are three possible formats that can be used for representing machine language data in BASIC programs. These formats are:

Decimal Numbers

- numbers between 0 and 255 represent specific bytes of machine code.

Hexadecimal Numbers

- two characters stand for one byte of machine code.

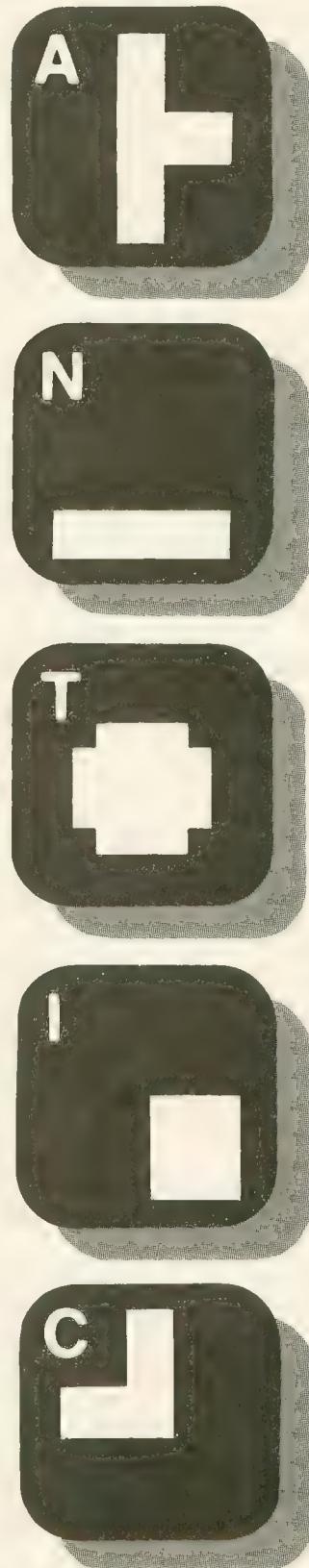
ATASCII Characters

- the ATASCII numerical value of each character in a string represents a byte of machine code.

I put together the following chart so it would be easier for me to hand-disassemble short subroutines, or modify them slightly, without having to load an assembler into my Atari. The chart lists all opcodes (assembly language operating codes) in numerical order—alongside the corresponding hexadecimal values, ATASCII characters and assembly language formats (Alforms).

Donny Cherf is a computer science major from Merced, California. One of his earlier projects was an Atari version of the Yahtzee game.

continued on next page



assembly language

Decimal and Hex Codes for Instruction Set NUMERICAL

DEC	HX	CHAR	opc	ALform	DEC	HX	CHAR	opc	ALform	DEC	HX	CHAR	opc	ALform
0	00	♥		BRK	89	59	Y	EOR	aaaa,Y	174	AE	■	LDX	aaaa
1	01	†		ORA (aa,X)	93	5D	□	EOR	aaaa,X	176	B0	0	BCS	aa
5	05	■		ORA aa	94	5E	▲	LSR	aaaa,X	177	B1	1	LDA	(aa),Y
6	06	‡		ASL aa	96	60	◆	RTS		180	B4	4	LDY	aa,X
8	08	■		PHP	97	61	●	ADC	(aa,X)	181	B5	5	LDA	aa,X
9	09	■		ORA #nn	101	65	■	ADC	aa	182	B6	6	LDX	aa,Y
10	0A	■		ASL A	102	66	†	ROR	aa	184	B8	8	CLV	
13	0D	■		ORA aaaa	104	68	■	PLA		185	B9	9	LDA	aaaa,Y
14	0E	■		ASL aaaa	105	69	■	ADC	#nn	186	BA	⋮	TSX	
16	10	⊕		BPL aa	106	6A	■	ROR	A	188	BC	〈	LDY	aaaa,Y
17	11	■		ORA (aa),Y	108	6C	■	JMP	(aaaa)	189	BD	⋮	LDA	aaaa,X
21	15	■		ORA aa,X	109	6D	■	ADC	aaaa	190	BE	〉	LDX	aaaa,Y
22	16	■		ASL aa,Y	110	6E	■	ROR	aaaa	192	CO	@	CPY	#nn
24	18	■		CLC	112	70	■	BVS	aa	193	C1	Ⓐ	CMP	(aa,X)
25	19	■		ORA aaaa,Y	113	71	■	ADC	(aa),Y	196	C4	D	CPY	aa
29	1D	↓		ORA aaaa,X	117	75	■	ADC	aa,X	197	C5	E	CMP	aa
30	1E	↔		ASL aaaa,X	118	76	■	ROR	aa,X	198	C6	F	DEC	aa
32	20	□		JSR aaaa	120	78	■	SEI		200	C8	H	INY	
33	21	!		AND (aa,X)	121	79	■	ADC	aaaa,Y	201	C9	I	CMP	#nn
36	24	\$		BIT aa	125	7D	■	ADC	aaaa,X	202	CA	J	DEX	
37	25	%		AND aa	126	7E	■	ROR	aaaa,X	204	CC	L	CPY	aaaa
38	26	&		ROL aa	129	81	■	STA	(aa,X)	205	CD	M	CMP	aaaa
40	28	(PLP	132	84	■	STY	aa	206	CE	N	DEC	aaaa
41	29)		AND #nn	133	85	■	STA	aa	208	D0	P	BNE	aa
42	2A	*		ROL A	134	86	■	STX	aa	209	D1	Q	CMP	(aa),Y
44	2C	,		BIT aaaa	136	88	■	DEY		213	D5	U	CMP	aa,X
45	2D	...		AND aaaa	138	8A	■	TXA		214	D6	V	DEC	aa,X
46	2E	+		ROL aaaa	140	8C	■	STY	aaaa	216	D8	X	CLD	
48	30	0		BMI aa	141	8D	■	STA	aaaa	217	D9	Y	CMP	aaaa,Y
49	31	1		AND (aa),Y	142	8E	■	STX	aaaa	221	DD	J	CMP	aaaa,X
53	35	5		AND aa,X	144	90	■	BCC	aa	222	DE	^K	DEC	aaaa,X
54	36	6		ROL aa,X	145	91	■	STA	(aa),Y	224	E0	♦	CPX	#nn
56	38	8		SEC	148	94	■	STY	aa,X	225	E1	ⓐ	SBC	(aa,X)
57	39	9		AND aaaa,Y	149	95	■	STA	aa,X	228	E4	ⓘ	CPX	aa
61	3D	...		AND aaaa,X	150	96	■	STX	aa,Y	229	E5	ⓘ	SBC	aa
62	3E	≥		ROL aaaa,X	152	98	■	TYA		230	E6	f	INC	aa
64	40	♂		RTI	153	99	■	STA	aaaa,Y	232	E8	h	INX	
65	41	♂		EOR (aa,X)	154	9A	■	TXS		233	E9	i	SBC	#nn
69	45	F		EOR aa	157	9D	■	STA	aaaa,X	234	EA	J	NOP	
70	46	F		LSR aa	160	A0	■	LDY	#nn	236	EC	I	CPX	aaaa
72	48	H		PHA	161	A1	■	LDA	(aa,X)	237	ED	m	SBC	aaaa
73	49	I		EOR #nn	162	A2	■	LDX	#nn	238	EE	n	INC	aaaa
74	4A	J		LSR A	164	A4	■	LDY	aa	240	F0	p	BEQ	aa
76	4C	L		JMP aaaa	165	A5	■	LDA	aa	241	F1	q	SBC	(aa),Y
77	4D	M		EOR aaaa	166	A6	■	LDX	aa	245	F5	u	SBC	aa,X
78	4E	N		LSR aaaa	168	A8	〈	TAY		246	F6	v	INC	aa,X
80	50	P		BVC aa	169	A9	〉	LDA	#nn	248	F8	x	SED	
81	51	Q		EOR (aa),Y	170	AA	*	TAX		249	F9	g	SBC	aaaa,Y
85	55	U		EOR aa,X	172	AC	†	LDY	aaaa	253	FD	K	SBC	aaaa,X
86	56	V		LSR aa,X	173	AD	...	LDA	aaaa	254	FE	Ⓛ	INC	aaaa,X
88	58	X		CLI										



COMPUTER PALACE

Your **ATARI®**
Holiday Gift
Headquarters!

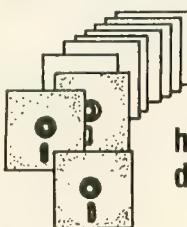


MONKEY WRENCH II

Now Available
for the XL!

Open up a whole new world of Basic computing ease. 33 new direct mode Basic commands and functions. Also includes a machine language monitor with 16 commands to interact with the 6502.

LOW Price!
\$44.90
Cartridge
Specify 800 or XL Series


**10-SSDD
DISKETTES**
Our
high quality
double
density!
ONLY \$15.95



48K
Disk or Tape

ZOMBIES

From Bram

- Fast, furious action
- Scrolling, 3-D graphics
- 1 player or cooperative 2-player modes
- 74 colorful screens
- Multi-levels

\$31.50

FREE CATALOG

With any order
(refundable with first purchase)



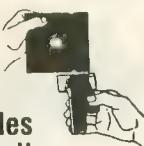
This is the most comprehensive Atari reference catalog available! It contains over 3000 software & hardware listings with illustrations and descriptions!

**IF YOU DON'T HAVE OUR
CATALOG... YOU'RE
MISSING OUT!**

ATARI REPAIR PARTS

Joystick PC board	\$ 2.49
Joystick cord	2.95
Joystick inner handle	1.49
13-Pin I/O Plug	9.95
6 ft. I/O Cord	19.95
Printer Cable	29.95
Monitor Cable	14.95

NEW!



Now
use both sides
of your diskettes

Simply place the disk against the built-in stops and squeeze.

The Quorum **ONLY**
DISK NOTCHER **\$14.95**

From Big Five

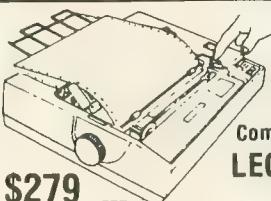
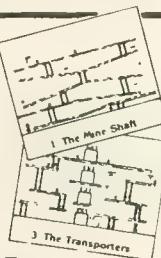
MINER 2049er

- 10 Different Screens
- 16K Cartridge
- Spectacular Sound & Graphics

Price \$49.95
OUR PRICE
ONLY

\$17.95

*Limited quantities.



\$279

+ FRT

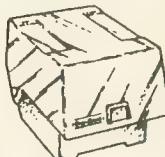
Features unique "square dot" print head with the best print quality for the money. 80 CPS, bi-directional and Epson compatible. Plain or Pin-fed paper.

AXIOM GP-550AT

\$299 + FRT

Direct-connect to any Atari computer without any interface! Features a "near letter quality" print mode, bi-directional printing, graphics capability and Plain and Pin-fed paper.

THE DISK BANK



\$15.95

Stores up to 50 disks. Features smoked gray cover with snap-lock, dividers, and built-in carrying handle

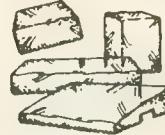
Another
Winner
from
Micropose

48K Disk
\$31.50



Strap into your ejection seat and get ready for air combat in the electronic cockpit of the \$20,000,000 F-15 STRIKE EAGLE!! This one has it all: after burners, multiple radars, air to air missiles, cannon, 3-D and more. Includes 7 different combat missions, 4 skill levels and an infinite variety of scenarios

Protect Your
Equipment!



DUST COVERS

Available For: ATARI 400, 800, 600XL, 800XL, 1200XL, 410, 810, 1050, 1025, 1027, EPSON FX-80, RX-80, MX-80, GEMINI 10X, PROWRITER 8510, PERCOM, RANA 1000, INDUS GT.

Additional Covers
Ordered at Same Time
**ONLY \$8.95
EACH**
**ONLY \$7.95
each**

Outsmart Your Friends . . .
Outwit the Dragon . . .
Join the Quest . . .

TRIVIA QUEST

from Royal Software



\$39.95 48K Disk

(Program Covers 4 Disk Sides)

A new concept in computer gaming. Intellectual challenge, strategy and arcade action. Each player assumes the role of a lord with a questing party of three characters. Complete the quest, earn the most gold by correctly answering questions and battling the dragon. Win the favor of the king and thus, the game.

• Utility Disk—1000 additional questions plus create your own . . . \$24.95



The
Ultimate
Screen
Dump
Program

This powerful and easy-to-use utility will allow you to dump almost any Atari text or graphics screen to your printer (even while the program is running)!

48K Disk
For All Computers
\$26.95

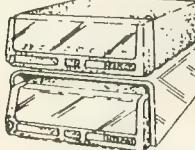


EXODUS: ULTIMA III

Reg. \$59.95

48K Disk **\$39.95**

A Super Value for the newest in the Ultima Series.



RCP DRIVE STACKER

Only
\$19.95

This attractive smoked-acrylic stand allows you to stack 2 Indus GT Drives for convenient operation (also fits the RANA 1000 and Concorde drives), or use as stand for modem, telephone, disk file, etc.

Double Plays from Synapse

PAK I

Quasimoto
Air Support

PAK II

New York City
Electrician

PAK III

Rainbow Walker
Countdown

Get two games for the price of one in any one of these two game packs from Synapse.

ONLY \$24.95

DRIVES—DRIVES—DRIVES

Atari
Indus

Rana
Percom

Trak
Amdek

**CALL FOR SPECIAL
HOLIDAY PRICING!**

SHIPPING INFO: Minimum \$2.90 Ground, \$4.75 Air. Actual Cost depends on weight. Call (503) 683-5361 for information.

WARRANTY INFO: Everything that we sell is warranted by the manufacturer. If any item purchased from us fails to perform properly when you receive it, call us at (503) 683-5361 so that we can assist you. No returned merchandise accepted without authorization. Defective software will be replaced with another copy of the same program, otherwise, no software is returnable.

COMPUTER PALACE



OPEN M-F, 9-6 Sat, 10-4 (Pacific Time)

2160 W. 11th Avenue Eugene, Oregon 97402

USE YOUR CREDIT CARD & CALL

Toll Free **1-800-452-8013**

★ ORDERS ONLY, PLEASE ★

There's never a penalty for using your credit card!
For Information, Call (503) 683-5361

Antic®

SOFTWARE STORE



Useful Applications

ANTIC GRAPHICS DEMO #1
1 SPIDER from ANTIC Vol. 1, No. 3
2 RAINBOW 3 HORSES 4 ATARI LOGO 5 OXYGEN
6 SPIRAL 7 PRETTY 8 MESSAGE and more

ANTIC PHOTO GRAPHICS

1 DIGITIZED PHOTOS
ANTIC GR. & SO. DEMO #1
1 GRAPHIC 2 DRAW 3 RAINBOW 4 RUNE RITE
5 ETCH SKETCH 6 BABY PRO SOUND and more

ANTIC MUSIC DISK #1

Requires BASIC Composer Cartridge
1 PRELUDE 2 JOPIN 3 IN MY LIFE 4 STAR TREK
5 DAISY 6 GREENSLEEVES
7 YELLOW SUBMARINE, and many more

ANTIC MUSIC DISK #2

Does not require MUSIC Cartridge
1 HARMONIA 2 PIANO 3 STARWARS
4 YOUNG & THE RESTLESS 5 MASH 6 CHOPSTIX

ANTIC UTILITY DISK #1

1 DOC program allows you to accompany programs with separate documentation on disk
2 MICROASSEMBLER allows you to create USR routines assembled more
3 MEMTRIP automatic line numbering utility in BASIC
4 MEMTEST runs without BASIC cartridge, to test all memory
5 PRINTNCP connect parallel printer from jacks 3 & 4

ANTIC UTILITY DISK #2

1 BUBBLE SORT from ANTIC Vol. 1, No. 4
2 TYPE from ANTIC Vol. 1, No. 3
3 HOME INVENTORY
4 REMNUMBER 5 COMPARE, listings for differences
6 MODEM 7 RT CLOCK and more

ANTIC UTILITY DISK #3

1 DISASSEMBLER from ANTIC Vol. 2, No. 1
2 THE TEXT from ANTIC Vol. 2, No. 6
3 DATA TEXT WINDOW from ANTIC Vol. 2, No. 1
4 LABEL disk label on Epson
5 SET UP disk sets up MX80 for Visicalc

ANTIC FORTH NEW

A two-sided disk containing the fig-Forth language and editor plus a disk tutorial

ANTIC BUSINESS DISK NEW

Over 14 business and financial programs including
1 FINANCIAL 2 BARGRAPE 3 BANKBALANCE 4 IRA
5 BUSINESS A multi-menu collection of programs
6 IRR 7 SINKFUND

ANTIC COMPUTER TUTOR NEW

Learning games for youngsters, including
1 BARBERS 2 a mystery!
2 FRENCHGAME English/French flashcards
3 MATHWAR 4 CONCENTRATION
5 QUIZ A giant multi-purpose test program

ANTIC TELECOMMUNICATIONS NEW

New improved AMODEM plus AUTODIAL system and
1 TECNO 2 DISKLINK 3 AUTODIAL

*Not included in cassette version.

Games!

Games! Games!

ANTIC GAMES DISK #1
1 CHICKEN a great game from Antic Vol. 1, No. 1
2 HANGMAN the traditional word game
3 CREATION 4 REVERSE 5 MONOPOLY
6 LUNAR LANDER 7 ZONEK hidden color patterns
8 CLEWSO detective adventure

ANTIC GAMES DISK #2
1 DEATHSTAR 2 BLACKJACK
3 CIVIL WAR a strategy simulation
4 ARTILLERY 5 WUMPUS text adventure

ANTIC GAMES DISK #3
1 PETAL 2 SHOWDOWN
2 FREEZE from Antic Vol. 1, No. 3 4 DRAW
5 PLUS ZERO 6 COLLISI
7 SPEED DEMON and more

ANTIC GAMES DISK #4
1 VULTURES Stan Ockers again!
2 CASTLE HEXAGON once again!
3 ADVENTURE the remainder of the disk contains an adventure game which you can play or modify to write your own adventure games

ANTIC GAMES DISK #5
1 BAT-SAN Ockers once again!
2 STELLAR DEFENSE once again!
3 HAMMERABI the classic simulation 4 SLALOM
5 COUCH analyze yourself 6 ACLEDYUC & MORE

ANTIC GAMES DISK #6
1 IMPROVED LUNAR LANDER
2 SUPER WUMPUS SAM requires S.A.M. cartridge
3 MOONBASE 4 GRAVITY 5 PIG 6 FISH
7 DEFENSE

ANTIC GAMES DISK #7
Only 2 games but they take up the whole disk!
1 HERBIE 4 levels and 4 programs to create them
2 SMOKEY Text & graphics simulation of a popular movie

ANTIC GAMES DISK #8 NEW
Never before seen on the public domain circuit! All original games submitted direct to Antic.
1 CALAMITY 2 GRID MASTER 3 JEOPARDY
4 DECOR 5 JUMP KING 6 DIGGER
7 SLAMMER 8 RONI'S TV
9 HIDDEN MEANINGS

ANTIC MACHINE LANGUAGE GAMES NEW
Fast machine-language action games
1 "WHIRLYBUG" 2 GREEKSHOW pinball
3 BLACKHOLE pinball 4 PASSIONATE music/graphics demo by Price and Gilbertson

Antic powers up your Atari with a fast-growing library of public domain software. These disks and cassettes are packed with outstanding programs created by Atari users all over the world. Antic adds NEW software releases just about every month.

At only \$10 each, plus \$1.50 per order for shipping and handling, Antic public domain software disks and cassettes are an extraordinary value.

All programs in this series are sold as is. There's no documentation included, except what's built into the programs. Therefore, you may need some expertise in order to use the products properly . . . and there may be some programming quirks you'll need to modify for your individual hardware system. However, all products have been tested at Antic and will perform. Due to unforeseen circumstances, contents may vary slightly from the descriptions here. But each disk and cassette is filled with proven useful programs.

Order today. Send check or money order and product coupon. Allow four weeks for delivery. Use the business reply envelope in this issue or mail your order to: **ANTIC'S SOFTWARE STORE**
524 SECOND ST., SAN FRANCISCO, CA 94107

PLEASE RUSH ME THE FOLLOWING ITEMS. HURRY!

	CASSETTE	DISK	CASSETTE	DISK
GAMES #1	<input type="checkbox"/>	<input type="checkbox"/>	UTILITY #1	<input type="checkbox"/>
GAMES #2	<input type="checkbox"/>	<input type="checkbox"/>	UTILITY #2	<input type="checkbox"/>
GAMES #3	<input type="checkbox"/>	<input type="checkbox"/>	UTILITY #3	<input type="checkbox"/>
GAMES #4	<input type="checkbox"/>	<input type="checkbox"/>	FORTH	<input type="checkbox"/>
GAMES #5	<input type="checkbox"/>	<input type="checkbox"/>	BUSINESS DISK	<input type="checkbox"/>
GAMES #6	<input type="checkbox"/>	<input type="checkbox"/>	COMPUTER TUTOR	<input type="checkbox"/>
GAMES #7	<input type="checkbox"/>	<input type="checkbox"/>	TELECOMMUNICATIONS	<input type="checkbox"/>
GAMES #8 NEW	<input type="checkbox"/>	<input type="checkbox"/>	DISKS	<input type="checkbox"/>
GAMES #9 NEW	<input type="checkbox"/>	<input type="checkbox"/>	CASSETTES @ \$10 each = \$	<input type="checkbox"/>
MACHINE LANG. GAMES NEW	<input type="checkbox"/>	<input type="checkbox"/>	CA res. add 6 1/2% sales tax	<input type="checkbox"/>
GRAPHICS DEMO #1	<input type="checkbox"/>	<input type="checkbox"/>	+ \$2.00 shipping & handling \$	<input type="checkbox"/>
GRAPHICS & SOUND #1	<input type="checkbox"/>	<input type="checkbox"/>	TOTAL \$	<input type="checkbox"/>
PHOTO GRAPHICS	<input type="checkbox"/>	<input type="checkbox"/>		
MUSIC #1	<input type="checkbox"/>	<input type="checkbox"/>		
MUSIC #2	<input type="checkbox"/>	<input type="checkbox"/>		

Name _____ PLEASE PRINT _____

Address _____

City _____ State _____ Zip _____

Make checks payable to ANTIC PUBLISHING

Phone Toll-Free . . . for even faster service on Credit Card orders: (800) 227-1617,
Ext. 133. In California, (800) 792-3545, Ext. 133



\$69.95 (Rom)
\$49.95 (D or C)

Vastly SUPERIOR to any translation programs
available FOR ATARI
1200XL/600XL/800XL with 64K.
(Please specify computer model number!)

THE XL "FIX"!

The Atari XL series computers represent power, sophistication, and flexibility virtually unrivaled in today's Home Computer Market.

With "approximately" 30-40% of existing software being "incompatible", a real, and serious problem exists. Because of this we have developed THE XL "FIX"!

ADVANTAGES over cheaper "translation products":

1. The XL "FIX"! is capable of fixing more software . . . an estimated **30% more software!**
2. The XL "FIX"! is available in **DISK, CASSETTE**, and now **ROM!**
3. XL "FIX"! versions fix ALL THREE types of software (Disk - Cassette - and Cartridges!)
4. The XL "FIX"! (disk or cassette) adds **OVER 4K** of usable RAM to your computer (anyone using Data bases or Word processors will **really** appreciate this feature!)
5. You never have to hold the **OPTION** button down on 600XL or 800XL computers!
6. **VERY IMPORTANT!** You need to load the XL "FIX"! only **once** . . . you can **change** disks, cassettes, or cartridges **without** rebooting the XL "FIX"! each time (disk or cassette)!
7. The **ROM** version is instantaneous upon computer power up, has a high speed cursor, is instantly switchable to your original operating system, will work with 16K 600XL's, and more!

The XL "FIX"! . . . another SUPERIOR product! **64K required!**

DISTRIBUTOR/DEALER inquiries welcome

Mastercard-Visa-Money
Order or Cashier Check.
Phone **(716) 467-9326**
Please specify computer
model number!

Send \$49.95 (\$69.95 for Rom)
plus \$4 shipping and handling
(N.Y.S. residents please add 7%) to:
COMPUTER SOFTWARE SERVICES
P.O. Box 17660
Rochester, New York 14617



\$69.95 (Rom)
\$49.95 (D or C)



THREE NEW PRODUCTS!

THE "SUPER PILL"!

Exactly the same as the WORLD'S leading cartridge backup device . . . **THE PILL**! . . . except it's even simpler to operate, it's **SWITCHLESS!** Excellent for families having young children. Totally eliminates opening computer doors and switches. **THE "SUPER PILL"!** is the most advanced state of the **CARTRIDGE BACKUP** device available today. It is totally compatible with all ATARI computers and all programs backed up by the original "PILL". Only \$79.95 plus \$4 shipping and handling.

THE "PROTECTOR/SILENCER"!

The "**PROTECTOR**"! is a disk and hardware modification (no soldering) for Atari 810, 1050, and Indus GT disk drives that will allow you to write true **BAD SECTORS** wherever you wish (not to be confused with ridiculous speed control or tape jerking schemes!). **Powerful** disk program finds hidden directories, scrambles existing directories, fast maps, hex conversions, disk dupes, and much more!

The "**SILENCER**"! quiets your drive tremendously (eliminates the **LOUD** grinding noise when you read a bad sector!), PLUS it allows you to **WRITE TO BOTH SIDES** of any disk **WITHOUT** cutting or notching the disk! Both for only \$49.95 plus \$4 shipping and handling.

THE "COMPANION"!

An amazing device that will enhance the capabilities of the **XL "FIX"!** or Atari Translator. It will allow you to **de-select BASIC** (no more need to hold the **OPTION** button while loading programs on the 600XL's and 800XL's), and it will allow you to **de-select the DIAGNOSTICS** (no more bad loads because of the DIAGNOSTICS jumping into the middle of your program load routine!). Installation is simple (10 minutes) and requires NO soldering! Only \$29.95 plus \$4 shipping and handling.

DISTRIBUTOR/DEALER inquiries welcome.

Our other fine products include THE "PILL", XL "FIX", "IMPOSSIBLE", "METAMORPHOSIS", and "REMOTE"!

Mastercard-Visa-Money

Order or Cashiers Check.

Phone orders:

(716) 467-9326.

Atari is a TM of Atari Inc. The "**METAMORPHOSIS**"! is a TM of Computer Software Services (division of S.C.S.D., Inc.)

COMPUTER SOFTWARE SERVICES
P.O. Box 17660
Rochester, New York 14617



\$149.95



For years they said it couldn't be done . . . **"IMPOSSIBLE"!** they claimed!

\$149.95

Backup almost any disk currently available (even **heavily protected** programs) with an **UNMODIFIED** disk drive!
Works with **ANY** disk drive!

PURPOSE: The "**IMPOSSIBLE**" was developed in response to the estimated half million disk drive users that own a drive other than the Atari 810 (Indus, Per-com, Trak, Rana, Astra, etc.) that wish to **BACK UP** their **protected software**. Due to a radically new technology developed by Computer Software Services, modification to your disk drive has been eliminated! The advantages are obvious! Drive warranties are not violated, the chance accidental damage has been eliminated, etc., etc.

OPERATION: The "**IMPOSSIBLE**"! consists of a disk program (**unprotected** so you can make as many backups as you wish) and a 4K STATIC RAM pack which is inserted into your computer (no soldering!) The "**IMPOSSIBLE**"! will read your program disk and then **re-write it in an unprotected format!** You may make additional backup copies using a sector copier or even regular DOS! Because your backup copy no longer has **BAD SECTORS** or **EXOTIC FORMATS**, the program data can now be manipulated into DOS compatible files (even double density!), transferred to cassette, etc. (with the aid of our Satellite programs!) No user programming knowledge required. A few programs require logical thinking.

FEATURES:

1. Backup protected disks
2. Handles most MULTI-LOAD programs
3. Makes DOS files (with Satellite option)
4. Up to 90K data input capable

5. AFSD-Automatic FUZZY Sector Discriminator
6. Expands computer memory to 52K usable
7. Simple NO SOLDER installation
8. Satellite expandable

PROJECTED SATELLITES: A "**COMPACTOR**" program which will convert your program into DOS compatible files (double density compatible!) for the storage of several programs on one disk. A "**COLUMN 80**" program for Word Processing, etc. It allows 80 columns on the screen! The "**XL-MATE**" will allow programs made with your 400/800 "**IMPOSSIBLE**"! to now play on your XL Computer! The **METAMORPHOSIS II** program will allow you to convert your **protected CASSETTES** into disk DOS files and vice-versa. All satellite programs must be used with in conjunction with The "**IMPOSSIBLE**"!

REQUIREMENTS: The "**IMPOSSIBLE**" diskette, the 4K STATIC RAM pack, a 400 or 800 computer (please specify!) with 48K and "B" Rom's. NOTE! The very old ATARI computers were shipped with "A" Rom's which had some serious "Bugs". Even if you don't own an "**IMPOSSIBLE**", you should upgrade to "B" Rom's (simple to install!) We have them available at a very inexpensive price. CALL US! "XL" version available soon!

NOT A PIRATING TOOL: We at C.S.S. did not design The "**IMPOSSIBLE**"! to put Software Manufacturers out-of-business overnight! Nearly all of our products have been "ripped-off" by industry parasite who have little or no ability to develop a product of their own so we can sympathize with their dilemma. All C.S.S. products have built-in safe guards which prohibit their use for flagrant pirating. The "**IMPOSSIBLE**"! is no exception! While The "**IMPOSSIBLE**"! backs up the most heavily protected programs, it also checks to see that the 4K STATIC RAM pack is installed before allowing the backup copy to execute!

EXAMPLES: The "**IMPOSSIBLE**"! has been tested on 300 of the most popular and heavily protected programs we could find. With nearly 4000 programs for Atari, we DO NOT guarantee that it will backup all programs in the past-present-and-future! We will supply updates at \$6 each (non-profit!) if and when necessary. Programs we have successfully backed up include: Blue Max, Visi-cal, Archon, Mule, File Manager 800+, Syn Calc, Syn File, One on One, 7 Cities of Gold, Super Bunny, Load Runner, Drol, and Gumball just to name a few!

Mastercard-Visa-Money
Orders or Cashier Check.
Phone: **(716) 467-9326**
Please specify computer
model number!

Send \$149.95 plus
\$4 shipping and handling
(N.Y.S. residents please add 7%)

COMPUTER SOFTWARE SERVICES
P.O. BOX 17660
ROCHESTER, N.Y. 14617

service center

ALABAMA	TESTEK VIDEO REPAIR CO. 2009 CENTERPOINT RD BIRMINGHAM 205-854-5212	COMP-U-PHONE 7224 VALJEAN AVE. VAN NUYS 818-786-6890	VANOVER TV HOSPITAL 2027 CUMBERLAND AVE. MIDDLESBORO ORLANDO 606-248-3827	THE FAMILY COMPUTER CENTER 3895 W. 12 MILE RD. BERKLEY 313-543-0520	S R DATA 2141 WOODBRIDGE AVE. EDISON 201-985-5017
RAINFOREST CITY SERVICE CENTER	15000 7TH ST. SUITE 214 VICTORVILLE 619-245-3622	COMPUTER JUNCTION, INC. GOODWIN'S ELECTRONICS JUNCTION SHOPPING CENTER ALBANY 912-435-9605	LOUISIANA COMPUTER ELECTRONICS 1955 DALLAS DR. BATON ROUGE 504-924-8066	CHASE TRANSISTOR SERVICE 521 LEONARD ST. NW GRAND RAPIDS 616-454-9000	ADVANCED ELECTRONICS VILLAGE SHOPPING CENTER RT. 206 FLANDERS 201-584-1252
GADSEN	244 RAINBOW PLAZA 205-442-6810	COLORADO AMERICAN TELEVISION SERVICE CO. 1226 W. LITTLETON BLVD. LITTLETON 303-795-2040	GEORGIA NORMAN'S ELECTRONICS, INC. 4014 PEACHTREE RD. NE ATLANTA 404-237-3349	MASSACHUSETTS CUSTOM ELECTRONICS 238 EXCHANGE ST. CHICOPEE 413-592-4761	TELSAR ELECTRONIC SERVICES, INC. 829 STONE RD. LAUREL SPRINGS 609-783-8500
BUSINESS SERVICES	2828 CHESTNUT ST MONTGOMERY 205-834-2290	LOOKING GLASS MICROPRODUCTS 4233 WEST EISENHOWER LOVELAND 303-669-2681	ELECTRONIC SPECIALISTS 1685 EDNA PLACE MACON 912-742-5628	BEACON TV-ELECTRONICS 8 TILESTON ST. EVERETT 617-389-8600	VIDEO ELECTRONICS COMPUTER SVC 1418 ROSELLE ST. LINDEN 201-925-1418
ARIZONA	RICK'S TV & APPLIANCE 1104 E. DEUCE OF CLUBS SHOW LOW 602-537-7625	FLORIDA R & S ELECTRONICS, INC. 3245 W. MCNAB RD FT. LAUDERDALE 305-979-6763	RADIOS AND MICROCOMPUTERS INC. 3833A WASHINGTON RD MARTINEZ 404-863-9071	CONDOR SERVICE 372 SOUTH MAIN ST. SHARON 617-784-2382	VIDEO CONNECTION OF SOMERSET 900 EASTON AVE. SOMERSET 201-545-8733
CALIFORNIA	D & G COMPUTERS 4156 MANZANITA AVE. #200 CARMICHAEL 916-485-7779	BOURQUE'S ELECTRONIC SERVICE 180 RICHPIEN RD. FT. WALTON BEACH 904-862-3346	HARRIS TV 1 E. MONTGOMERY CROSSROAD SAVANNAH 912-927-2084	ROCCOM, INC. 184 MAIN ST. WAREHAM 617-295-2542	K & S ELECTRONICS 119 HAMILTON BLVD. SOUTH PLAINFIELD 201-755-4204
SAN JOSE COMPUTER	1844-E ALMADEN RD. SAN JOSE 408-723-2025	MR. SOFTWARE 101 HOLLYWOOD FASHION CENTER HOLLYWOOD 305-981-9090	HAWAII KONA COMPUTER 75-5706 HANAMA PL. #107 KAILUA-KONA 808-329-8574	MARYLAND NATIONAL BUSINESS & SECURITY 8639 LOCH RAVEN BLVD. BALTIMORE 301-665-8870	MINNESOTA PHILIPS COMMUNICATIONS & TV 748 N.E. HARDING ST. MINNEAPOLIS 612-378-7200
B & C COMPUTERTV	3400 EL CAMINO REAL SANTA CLARA 408-554-0666	ENTERTAINMENT SERVICES ELECT. 811 EDGEWOOD AVE. S. JACKSONVILLE 904-786-1305	ILLINOIS DIGITAL WORLD, INC. 711 ARMY TRAIL RD. ADDISON 312-543-9000	EDGEWOOD TV & AUDIO 4932 EDGEWOOD RD. COLLEGE PARK 301-441-9116	NEW YORK ISLAND VIDEO COMPUTER SERVICE 35 MIDDLE COUNTRY RD. CORAM 515-736-1001
ATCOM COMPUTERS	1421 THOUSAND OAKS BLVD. THOUSAND OAKS 805-497-1220	COMPUTER IMAGE 10061 SUNSET DR. MIAMI 305-271-1224	OMEGA ENTERPRISES 7823 N. 2ND ST. ROCKFORD 815-282-1477	CROFTON TV & VIDEO SERVICE 2217 DEFENSE HWY CROFTON 301-721-1700	AARDWARK ELECTRONIC SERVICE 44 CASTLE ST. GENEVA 315-789-5295
AUTHORIZED COMPUTER SERVICE	951 W. FOOTHILL BLVD. UPLAND 714-985-2101	THE COMPUTER CORNER 7101 BROADWAY MERRILLVILLE 219-738-3282	COMPUSVISION COMPUTER CENTER 6445 BURWOOD PL. GLEN BURNIE 301-850-4055	COMMUNITY SOUND & VIDEO 1834 S. STEWART SPRINGFIELD 417-887-3391	LONG ISLAND COMPUTER GENERAL 103 ATLANTIC AVE. LYNNSBROOK 516-887-1500
INDIANA	WRIGHT ELECTRONICS 614 N. MAIN ST. EVANSVILLE 812-423-2845	CITIZEN'S TV & VIDEO 827 W. GLENPARK AVE. GRIFFITH 219-924-0047	ADVANCED COMPUTER SERVICE CO. 287 E. GREEN ST. WESTMINSTER 301-876-8202	A & E ELECTRONICS CORP 2001 BIG BEND BLVD. ST. LOUIS 314-645-7733	ABC ELECTRONICS SERVICE CO. 392 THURSTON RD. ROCHESTER 716-328-1840
KANSAS	MIDWEST APPLIANCE SERVICE METCALF SOUTH MALL OVERLAND PARK 913-341-6688	THE COMPUTER CORNER 7101 BROADWAY MERRILLVILLE 219-738-3282	MAIN AUTOMATIC SERVICES 22 TARGET INDUSTRIAL CIRCLE BANGOR 207-942-6769	J.D. ELECTRONICS 385 STEVENS AVE. PORTLAND 207-775-1411	OHIO ARJAY MICRO 1385 BETHEL RD. COLUMBUS 614-459-4219
KENTUCKY	FACTORY ELECTRONICS 2422 PALUMBO DR. LEXINGTON 606-269-7341	MICHIGAN FUTURE DIRECTIONS 1520 N. VAN DYKE BAD AXE 517-269-7211	SOUTHERN PHOTO TECHNICAL SVCE 2610 SOUTH BLVD. CHARLOTTE 704-523-0012	MISSISSIPPI ELECTRONIC SERVICES 2315 25TH AVE. GULFPORT 601-863-3772	STATION FUN TV, INC. 206 CLINTON ST. DEFIANCE 419-782-8545
CALIFORNIA ILLINOIS TEXAS WASHINGTON	83 Locations around the country Check the Yellow Pages for the location nearest you.	KENTUCKY FACTORY ELECTRONICS 2422 PALUMBO DR. LEXINGTON 606-269-7341	NEW JERSEY DEPENDABLE PARTS, INC. 168 MAIN ST. CHATHAM 201-635-5888	NORTH CAROLINA SOUTHERN PHOTO TECHNICAL SVCE 2610 SOUTH BLVD. CHARLOTTE 704-523-0012	COMPUTER CREATIONS, INC. KETTERING B AND G ELECTRONICS, INC. 15729 MADISON AVE. LAKEWOOD 216-521-2855
					ERIC MARTIN'S, INC. 5485 WARRENSVILLE CENTER RD. MAPLE HGTS 216-663-2032

Stereo, video, and now computer sales and service. Free estimates



Most Major Brands VISA, MasterCard, American Express

83 Locations around the country
Check the Yellow Pages for the location nearest you.

CALIFORNIA ILLINOIS
TEXAS WASHINGTON

service center

VIDEO COMPUTER WORLD,
INC.
2223 WOODVILLE RD.
OREGON
419-691-7282
DODD CO.
7795 W. RIDGEWOOD DR.
PARMA
216-886-2828
OREGON
NORTHWEST COMPUTER
SUPPORT, INC.
10200 S.W. NIMBUS G-1
PORTLAND
503-684-3280

PENNSYLVANIA
KIBLER'S INDEPENDENT TV
526 FALLOWFIELD AVE.
CHARLEROI
412-483-7484
PARK T. MORROW, INC.
627 W. 26TH ST.
ERIE
814-455-7566
DEBUG BYTES COMPUTERS
662 PHILADELPHIA ST.
INDIANA
412-349-7290
GRUSS ELECTRONIC REPAIR
HILLS PLAZA
JOHNSTOWN
814-266-1395
TESCO, INC.
9237 ROOSEVELT BLVD.
PHILADELPHIA
215-677-5000
NATIONAL TELEVISION
SERVICE
5461-63 PENN AVE
PITTSBURGH
412-361-5400
BOYD TV
719 LANCASTER AVE
WAYNE
215-688-3727

RHODE ISLAND
VIDEO ENCOUNTERS
MAINES SHOPPING CENTER
WAKEFIELD
401-783-3460
SOUTH CAROLINA
ELECTRONIC SERVICE CO.
1736 DECKER BLVD
COLUMBIA
803-782-2705
COASTAL TV & APPLIANCE
CO.
603 HWY 501
CONWAY
803-248-2686
SOUTH DAKOTA
TAYLOR AUDIO-VISUAL, INC.
1009 DAKOTA S.
HURON
605-352-3205
HOUSE OF TELEVISION
601 SOUTH DULUTH AVE.
SIOUX FALLS
605-338-9051
TENNESSEE
HI-FI SERVICE CENTER
4608 HIXSON PIKE
CHATTANOOGA
615-877-6781
BILL'S T.V. SALES & SERVICE
3843-C DICKERSON RD.
NASHVILLE
615-865-5000
TEXAS
TV CENTER
202 S. WILLIS
ABILENE
915-677-1171
PACIFIC STEREO
525 113TH ST.
ARLINGTON
817-640-3094

LONGS/ENTRONIX
5800 MAPLE AVE.
DALLAS
214-358-3222
COMPUTER HOME, INC.
3548 KNICKERBOCKER
SAN ANGELO
915-944-9795
UTAH
INTERWEST ELECTRONICS
CORP
4091 SOUTH STATE ST.
SALT LAKE CITY
801-266-5301
VIRGINIA
SALEM COMPUTER CENTER
4034 PLANK RD
FREDERICK
703-786-8126
VIDEO UNLIMITED SERVICE
CENTER
1707 ROUTE 17
GRAFTON
804-898-5318
L & Y ELECTRONICS
13670 JEFFERSON DAVIS
HWY.
WOODBRIDGE
703-494-3444
WASHINGTON
ON LINE COMPUTERS PLUS
13710 NE 20TH ST.
BELLEVUE
206-644-2080
BUTLER'S TV & COMPUTER
SERV CE
28717 PACIFIC HWY SOUTH
FEDERAL WAY
206-941-9096
ARTICULATE SYSTEMS
E 9405 SPRAGUE AVE.
SERV.CE CTR
SPOKANE
509-922-0255

JOHNSON'S TELEVISION
SERVICE
N 4424 WALL
SPOKANE
509-327-9566
WISCONSIN
AUTHORIZED TV
810 NINTH ST.
GREEN BAY
414-499-4215
DAN'S CITY WIDE T.V.
1259 E. JOHNSON ST.
MADISON
608-255-4144
MISTER TV SERVICE
5455 W. BURLEIGH ST.
MILWAUKEE
414-873-2415
WEST VIRGINIA
COMPUTERS PLUS, INC.
2077 CHARLESTON TOWN
CENTER
CHARLESTON
304-342-4848
Service Centers, Retailers, to
get your listing in Antic call
(415)661-3400

THE PARALLEL BUS REVEALED

continued from page 47

serious about writing professional-level software or designing any kind of hardware for the Atari computer, this manual is a must. As we go along, I'll briefly explain the concepts you need for these articles, but these explanations are not offered as a substitute for the Tech Reference Notes.

SUMMING UP

So far we've learned: The OS contains a Generic Handler for parallel devices. It selects one of up to eight devices

through a hardware register and keeps track of it through a shadow register. The parallel device has a ROM containing low-level driver vectors (and, perhaps, the drivers themselves) and an INIT routine. During coldstart, the OS will run the INIT routine and the device will declare its existence by writing its bit into the Device Mask and putting its name, along with the Generic Handler's address into HATABS. In operation, the device and the OS communicate through the 6502's A, X, and Y registers plus the Page Zero IOCB. The parallel device cannot use OS Floating Point routines

Antic
the ATARI® Resource

**SEEKS
AUTHORS**
for
**BOOKS
SOFTWARE
MAGAZINE
ARTICLES**
**Flat rate
or Royalty
Prompt
Response**

For details, send
self-addressed
stamped envelope to:

AUTHOR INFO
c/o ANTIC
524 Second Street
San Francisco, CA
94107

because the device's ROM is mapped into those same locations.

Not too hard, huh? Next month we'll look at hardware requirements, and after that, we'll work up an example and look at interrupts. In the meantime, try to resist the urge to tear off that little cover. We'll explain how to do it safely in the next **Antic**.

Earl Rice held a number of high-level technical positions at Atari, including head of users group support. His last post there was project leader of the projected top-of-the-line 1450XL computer.

A

NEW ATARI FLIGHT SIMULATOR

Latest Simulation Software

by CHARLES JACKSON
Antic Staff Writer

Professional pilots as well as armchair astronauts and arcade aces will enjoy these "uplifting" new programs for the Atari. **Flight Simulator II** and **Space Shuttle plus F-15 Strike Eagle** all offer more realism than many "professional" flight simulators.

SPACE SHUTTLE

Space Shuttle is a home version of the flight simulator used to train shuttle astronauts. You begin your mission in the cockpit 15 seconds before liftoff. Fire your main engines and watch a blue sky fade to black as you pilot the shuttle into orbit 210 miles above the earth. There, you must rendezvous with a satellite and return to earth before running out of fuel.

Your shuttle is equipped with five radar screens, two sets of retro rockets and a mission status board. Use the board to monitor elapsed time, position, speed, fuel level, plus status of

your engines, landing gear and pay load bay doors.

Programmers Steve Kitchen and Bob Henderson included many special effects. Just after liftoff, you'll see a flash of light and hear your booster rockets fall away from you. During reentry, while plummeting through the electrically charged upper atmosphere, some of your instruments will temporarily "black out," just as they do during actual shuttle flights. As you near the runway, you'll hear a pair of sonic booms as you pass through the sound barrier. Upon landing, your main tires squeal as the shuttle rolls to a halt at the end of the runway.

Space Shuttle offers three training modes: an introductory level to give you the "feel" of flying the shuttle, a "training" level to sharpen your piloting skills, and the "Mission" level where you must test your skill against the clock and a diminishing fuel sup-

ply. I'd recommend this simulation game for ages 10 and up.

FLIGHT SIMULATOR II

Flight Simulator II is the most advanced flight simulator program available for the Atari. It puts you in the pilot's seat of a true-to-life light airplane, a Piper Cherokee Archer. The program features four-color scenery including mountains, islands, buildings, parks and 80 usable airports. At the start, you're on a runway at Meigs Field near Chicago, facing the Sears building and John Hancock tower. The program also comes with recognizable scenery for Chicago, New York, Seattle and Los Angeles.

Flight Simulator II has an editor that can freeze your position and change any combination of flight conditions, such as altitude, speed, location,



GHTS

Flight Simulator II
SubLogic Corporation
713 Edgebrook Drive
Champaign, IL 61820
(217) 359-8482
\$49.95 38K-disk

Space Shuttle:
A Journey Into Space
Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
\$34.95 16K-cartridge

F-15 Strike Eagle
MicroProse Software
10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151
\$34.95, 48K-disk

power setting, weather conditions and time of day.

Beginners should be warned that Flight Simulator II is a sophisticated program with very detailed instructions. If you've never piloted an airplane before, your first few days with this software will be filled with stalls and crashes.

Flight Simulator II is not easy to fly. The plane is controlled by joystick plus much of the keyboard. You must press the right cursor arrow key 16 times to advance from idle to full

throttle. Press the [5] and [B] keys to look out of the rear window, and repeatedly press the [C] or [M] key to move the rudder.

The program comes with a 92-page book about aeronautics, a 90-page flight manual and pilot's handbook, four flight charts and a double-sided "quick reference" card. Flight Simulator II is not really a game, although it offers a "game" option. The program is actually an excellent training tool which can best be used by student pilots or aviation buffs aged 16 and up.

F-15 STRIKE EAGLE

Launch into the most exciting aerial combat since **Star Raiders** with F-15 Strike Eagle. Microprose Software has realistically computerized seven sky battlezones over the Mid-East and Viet Nam.

As the pilot of a fully equipped F-15 jet fighter, your first mission sends you into Libya to bomb military airfields and the Libyan Air Command Center. A Libyan Su-22 fires a heatseeking missile toward you as the dogfight begins. Should you need to refuel, you can land on the carrier Nimitz, now patrolling the Mediterranean just off the coast of Libya.

The U.S. Air Force F-15 offers state-of-the-art navigation and weapons systems, including computerized radar and tracking displays, radar jammers, electronic early-warning systems, automatic steering cues, eight supersonic guided missiles, 18 bombs and a 20mm cannon with 1,000 rounds of ammunition.

Your flight instruments, navigation cues and warning signals are projected onto the front windshield. These "heads-up" displays let pilots monitor their instruments while closing on a target. The game is the first flight simulator to include such a display.

The game is controlled by keyboard and joystick. A second joystick may be added to control your throttle and speedbrakes.

F-15 Strike Eagle is an engrossing game which challenges pilots of all skill levels. Beginners will enjoy flying the F-15. Jet aces will enjoy mastering it.

BLAKMAGIC SOFTWARE

Presents

MATH MAGIC

COPYRIGHT 1984

A family oriented math flash card game
MATH MAGIC'S features include:

- multiple players (1 to 6)
- handicapping for each player
- delightful music and graphics

In addition, MATH MAGIC supports:

addition	subtraction
division	multiplication
powers	root fractions and decimals

PLUS its largest number is 999,999

So, this is a chance for your child to learn to do more than count from 1 to 10, and with the handicap feature you and your children can compete on the same level.

LIST PRICE \$29.95

plus \$2.00 shipping Texas Res. add \$1.24

MC or VISA orders phone (409) 866-9765

DISK MAGIC

"one of the better dollar values on the market!"

Tom Graziano

COMPUCLUB NEWS

DISK MAGIC, the most comprehensive and user friendly disk utilities package you will ever use

FEATURES

Determine sector utilization & display various error codes — Edit & assemble sector data in HEX or ATASCII — Recover unformatable disks — Search for occurrences of HEX numbers or ATASCII strings — Calibrate drive speed & write BAD sectors on many drives — A smart sector copier

All this PLUS an excellent tutorial on disk structure to help you get started

LIST PRICE \$24.95

plus \$2.00 shipping Texas Res. add \$1.03

Available from CompuClub and other leading vendors, or order direct from

BLAKMAGIC SOFTWARE

3720 Broadmoor

Beaumont, TX 77707

SEMISOFT PRESENTS THE RECORDING STUDIO

So you always wanted to be a member of a Rock band with unlimited access to a recording studio... Well now release your creative impulse and we will provide the tools. Transform your Atari® into a RECORDING STUDIO.

At your command is a four track recording deck. With it, do laying, echos and sound on sound. Your keyboard simulates six different instruments each with two octave ranges. To top it all there is a musical editor which is a snap to use.

The RECORDING STUDIO is simple to use. Select a track, choose an instrument then start to play. Your Atari acts as your recording engineer.

MENU DRIVEN FUNCTIONS AND MODES

- Record
- Track Select
- Instrument Select
- Play
- Erase
- Time
- Forward
- Rewind
- Disk

EXTENDED FUNCTIONS AND FEATURES

- Track to track transfer
- Echo to any track
- Forward tape one unit
- Insert a rest
- One key play
- Directory
- Shift Notes within a track
- Color selector
- Back tape one unit
- Space bar standard notation
- Octave switch
- Fill a track

SYSTEM REQUIREMENTS: Any Atari home computer with at least 48K of memory, one joystick, at least one disk drive, and the heart of a child.

We welcome MASTERCARD—VISA—MONEY ORDERS—CERTIFIED CHECKS Card users please supply name on card, expiration date and card number.

N.Y. State residents please add 8.25% sales tax.

Price \$34.95 + \$3.00 postage

SEND TO:

SEMISOFT, SUITE 417
51 EAST 42 STREET
NEW YORK, NY 10017

Now works with Koala Pad

TELEPHONE ORDERS ACCEPTED
CALL 212-246-3165

DEALERS AND DISTRIBUTOR INQUIRIES WELCOMED.

*Atari is a registered trademark of Atari Computers Inc.

Software Discounters of America



For Orders Only 1-800-225-SOFT*

Inquiries and PA 412-361-5291 Open Saturday

- Free shipping on orders over \$100 in continental USA
- No surcharge for VISA/MASTERCARD

ACCESS

Beach Head (D)	\$23	INFOCOM	Up 'N Down (R)	\$29
Raid Over Moscow (D)	Call	Cut Throats (D)	SIERRA ON LINE	\$23
Scrolls of Abdon (D)	\$23	Deadline (D)	Dark Crystal (D)	\$25
Enchanter (D)	\$23	Hitchhiker's Guide to the Galaxy (D)	Homeworld (D)	\$43
Hitchhiker's Guide to the Galaxy (D)	\$23	Ultima I (D)	Mission Asteroid (D)	\$16

ACTIVISION

Decathlon (R)	\$25	Infidel (D)	Oil's Well (D)	\$19
Pitfall II (R)	\$25	Planetfall (D)	Ultima II (D)	\$23
River Raid (R)	\$25	Sea Stalker (D)	Ulysses (D)	\$23
Space Shuttle (R)	\$25	Sorcerer (D)	Wizard & Princess (D)	\$21
ARTWORK		Starcross (D)	Wiz Type (D)	\$23

BIG 5

Bridge 4.0 (T or D)	\$16	Suspect (D)	SPINNAKER	\$21
Monkeymath (T or D)	\$18	Suspended (D)	Adventure Creator (R)	\$21
Strip Poker (D)	\$21	Witness (D)	Alphabet Zoo (R)	\$21
BATTERIES INCLUDED		Zork I (D)	Delta Drawing (R)	\$21
Paperclip (D)	\$59	Zork II or III (D)	Facemaker (R)	\$21

BIG 5

Miner 2049er (R)	\$19	KOALA	Fraction Fever (R)	\$21
Scraper Caper (R)	Call	Touch Tablet w/Painter (D)	Hey Diddle (D)	\$19
Bank St. Writer (D)	\$43	Touch Tablet w/Painter (D)	Kids on Keys (R)	\$21
Mask of Sun (D)	\$25	LJK	Kindercomp (R)	\$21
Operation Whirlwind (D)	\$25	Data Perfect (D)	Story Machine (R)	\$21

CBS

Print Shop (D)	\$29	Letter Perfect (D)	Trains (D)	\$23
Spelunker (D)	\$19	Spell Perfect (D)	SUBLOGIC	
Stealth (D)	\$19	MICROPROSE	Flight Simulator II (D)	\$35
Whistler's Brother (D)	\$19	F-15 Strike Eagle (D)	Night Mission Pinball (D)	\$21
		Hellcat Ace (D)	Alley Cat (T or D)	\$21

CBS

Crisis Mountain (D)	\$19	MAC Alley Ace (D)	Blue Max (T or D)	\$21
Astro-Grover (R)	\$25	Solo Flight (D)	Ft. Apocalypse (T or D)	\$21
Big Bird's Spc. Delivery (R)	\$19	Spitfire Ace (D)	Necromancer (T or D)	\$21
Co-Co Notes (R)	\$19	Castle Wolfenstein (D)	Pharaoh's Curse (T or D)	\$21
Ernie's Magic Shapes (R)	\$19	Super Text (D)	Syn-Calc (Call)	\$21

CONTINENTAL

Home Accountant (D)	\$44	OSS	Syn-File (Call)	\$21
Atari Encyclopedia	\$13	Action (R)	Syn-Stock (Call)	\$21
Book of Adventure Games	\$13	Action Tool Kit (D)	Zeppelin (T or D)	\$21
		Basic XL (R)	TRONIX	
DOS XL (D)	\$25	MAC/65 (R)	Chatterbee (D)	\$25

DATA SOFT

Basic Compiler (D)	\$49	MAC/65 Tool Kit (D)	Pokersan (D)	\$16
Bruce Lee (T/D)	\$23	ORIGIN	S.A.M. (D)	\$39
Pooyan (T/D)	\$19	Ultima III (D)	ACCESSORIES	
Sands of Egypt (D)	\$19		Ape Face Printer Interface	\$57
EPIXY			Astra 2001 Dual Disk Drive	

DATA SOFT

Dragonriders Pern (D)	\$25	RESTON	Drive	Call
Fun w/ Art (R)	\$23	Movie Maker (D)	BASFS SS, DD,	\$16 bx
Gateway Apshai (R)	\$25	SSI	Compuserve Starter Kit	
Jumpman Jr (R)	\$23	Battle Normandy (D)	(5 hrs)	\$25
Pitstop (R)	\$25	Bomb Alley (D)	Disk Case (Holds 50)	\$12

DATA SOFT

Pitstop II (D)	\$25	Sands of Egypt (D)	Disk Case (Holds 100)	\$19
Summer Games (D)	\$25	Temple Apshai (T or D)	Disk Drive Cleaner	\$9
			Full Stroke Replacement	
Dragonriders Pern (D)	\$25		Keyboard for Atari 400	\$49
Fun w/ Art (R)	\$23		Indus GT Disk Drive	

DATA SOFT

Gateway Apshai (R)	\$25	Carrier Force (D)	MPP1000 Microbits Modem	\$119
Jumpman Jr (R)	\$23	Combat Leader (D)	Printer Interface	\$69
Flip Flop (T or D)	\$13	Computer Ambush (D)	Microbits 64K for 600XL	\$97
Spy vs. Spy (D)	\$19	Computer Baseball (D)	Muppet Learning Keys	
			Rana 1000 w/DOS	\$269

DATA SOFT

FISHER PRICE		Rail West (D)	Sakata 12" Green	\$89
Dance Fantasy (R)	\$19	Reforger '88 (D)	Sakata 13" Color	
Linking Logic (R)	\$19	War In Russia (D)	Monitor	\$229
Logic Levels (R)	\$19	Masterstype (D or R)	Verbatim Disks	
Memory Manor (R)	\$19	Songwriter (D)	Wico Boss	\$12

DATA SOFT

HBJ		SEGA	Wico Bat Handie	\$19
Computer SAT (D)	\$54	Spy Hunter (R)	Wico Trackball	\$29
		Tapper (R)		

P.O. Box 278—DEPT AT—WILDWOOD, PA 15091

*Ordering and Terms: Orders with cashier check or money order shipped immediately. Personal/company checks, allow 3 weeks clearance. No C.O.D.'s. Shipping: Continental U.S.A.—Orders under \$100 add \$3; free shipping on orders over \$100. PA residents add 6% sales tax. AK, HI, FPO-APO—add \$5 on all orders. International—add \$15 or 15% of order whichever is greatest. Defective merchandise will be replaced with same merchandise—NO CREDITS! Return must have authorization number (412)361-5291. Prices subject to change without notice. Order today, get it tomorrow! Overnight delivery is just \$17.50—software orders only in Continental USA.

DEALERS AND DISTRIBUTOR INQUIRIES WELCOMED.

*Atari is a registered trademark of Atari Computers Inc.

product reviews

ROME AND THE BARBARIANS NAPOLEON AT WATERLOO

KRENtek Software
P.O. Box 3372
Kansas City, KS 66103
(913) 362-9267

\$34.95 each, 32K—disk or cassette

Reviewed by Michael Ciraolo

In 476 A.D., the Roman Empire collapsed. Historians argue about the causes—internal bureaucratic problems, poor assimilation of conquered people, failure to withstand the barbarian hordes, etc. Now a game combines these factors with the number-crunching ability of the microcomputer and the Atari's graphics.

Rome and the Barbarians looks like a standard military simulation/strategy board game with smooth scrolling and joystick control of the cursor. However, it is not that simple.

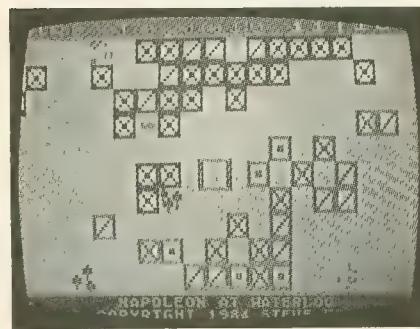
The screen shows the location of Roman units, rebel Romans, invading barbarians, allied barbarians, mercenaries and locals. This game's excellence comes from its realistic understanding of historical issues. The instruction manual warns that "Although Rome and the Barbarians is a military simulation, the strategy must be based on economics."

The economics involved are complex, but not overwhelming. You must consider city tax values, troop payment, your treasury, hiring barbarians, collecting taxes, barbarian tribe loyalty and so on.

Use the joystick to move the large, square cursor over a map of Europe. The map's graphics have nice touches, such as the snow-capped mountains turning brown in the summer. The joystick button determines troop movement. The [SELECT] and [OPTION] keys, pressed when the cursor is over one of the factions,



ROME AND THE BARBARIANS



NAPOLEON AT WATERLOO

cause the computer to display tax values, troop data and treasury information.

Documentation is excellent. It includes tips, insight into the game from designer Steve Krenek, historical observations, a map, and tax charts.

The amount of information that must be absorbed to play the game successfully is significant. This adds staying power to the game, but makes it difficult to simply boot up and play. The example and beginner games help.

Combat is attended by the sound of clanking swords. Because of the general lack of sound, this is abrupt and surprising.

Napoleon at Waterloo is a more basic version of Rome and the Barbarians. It is concerned with the military strategy involved in deploying forces and fighting. You play against the computer, using the same joystick and smooth scrolling from Krenek's other game. Simpler, shorter, and easier to play, Napoleon resembles the study an artist produces prior to painting a masterpiece. It's a good warm-up to Rome.

EPIDEMIC

Strategic Simulations, Inc.
883 Stierlin Road, Building A-200
Mountain View, CA 94043
(800) 227-1617, ext. 335 outside CA
(800) 772-3545, ext. 335 in CA
\$34.95, 48K—disk

Reviewed by Jordan Powell

Are you up for saving the world from a deadly infection from outer space? **Epidemic**, a new simulation game from SSI, allows you just this opportunity.

Meteorites bearing killer alien microbes are headed towards Earth. Your primary defensive weapons are missiles with nuclear warheads for destroying meteorites still in space. You can't hit all of them, though. And once a meteorite hits, the microbes multiply and spread, starting an epidemic. You combat this epidemic with an array of biological and other weapons. As a last resort, you can detonate nuclear devices to destroy entire areas, stopping the disease at the cost of millions of human lives. The goal is to neutralize the disease and stop the spread of epidemics with the least amount of casualties.

As in any good strategy game, you must juggle many variables and inter-related factors. Since you can only accomplish a certain amount in 24 hours, you must allocate your resources wisely. Should you attempt to destroy a meteorite, and if so, which one? Which area of the planet should receive which remedy? You must also deal with uncontrollable meteor impacts and the spread of a disease across geographical boundaries.

A wealth of information is displayed in various forms each turn, but you must know how to interpret it to make the right decisions. Some of the displays take a long time to develop, but they enhance the game by taking advantage of Atari's graphics. For instance, a map of the globe depicts all

continued on next page

product reviews

areas' current status with various colors and textures. The documentation is a little weak in its description of the displayed data, so you may have to read it a few times and play two or three practice games to understand everything.

A full game can take as long as an hour, but unfortunately, there's no way to save a game in progress. I found Epidemic frustrating to play initially, but as my ability increased the game became much more interesting. If you like games that require thought and the juggling of multiple factors to solve a problem, you'll enjoy Epidemic.

STAR WARS

Parker Bros.
50 Durham Road
Beverly, MA 01915
(617) 927-7600
\$44, 12K-cartridge

Reviewed by George Adamson

Star Wars: The Arcade Game (Parker Brothers) brings little to the Atari world beyond the appeal of the title. In this adaptation of the movie plot you fly a fighter, firing at other fighters before attempting to destroy the Death Star.

Moving the joystick moves a gun-sight; stationary cannons in each corner of the screen fire toward the sight. The poor 3-D effect would have been better if the cannons moved with the sight instead of remaining still.

The appearance of the Death Star is disappointing. It doesn't enlarge to give the illusion of approach. Instead, the screen switches without warning to converging lines representing the trench on the Death Star. There is little impression of movement through the trench.

Star Wars features a standard status line with points, level and remaining shields at the top of the screen. Despite bearing the name of a bestsell-

ing movie, this game quickly becomes monotonous and adds nothing to the state-of-the-art.

BRUCE LEE

Datasoft
1980 Nordhoff Place
Chatsworth, CA 91311
(213) 701-5161
\$34.95, 32K—disk and cassette

Reviewed by Harris Shiffman

Somewhere beneath Earth's surface lies the vast domain of an evil wizard. Within this realm lie treasures beyond imagining, protected by perils too great to number. The wizard has guarded his underground fortress well, and it will take all the skill and cunning of the greatest of all martial artists to prevail.

Welcome to the world of **Bruce Lee**, Datasoft's latest entry into the arcade adventure genre. As Lee, you explore the wizard's underground lair in hopes of finding his treasure. Passage from one chamber to the next is achieved by touching the right combination of lanterns that appear throughout the maze. Your only defenses against the dangers of the caverns are your hands, your feet, and years of athletic training.

There are numerous traps located throughout the many chambers. You'll also need to deal with the wizard's private army, a series of black-robed Ninja warriors and a large green fighter called Green Yamo. Although a few well-placed kicks dispatch these fellows, they're soon replaced. Fortunately, you are a good deal harder to kill than they are.

As an arcade-type adventure game, Bruce Lee represents a middle ground. It isn't as demanding of reflexes and endurance as Shamus and Shamus II, but is more difficult than the elementary Pharaoh's Curse (all from Synapse). The background graphics and animation, while not particularly

original or innovative, are clean and attractive, and player response to joystick movement is very good.

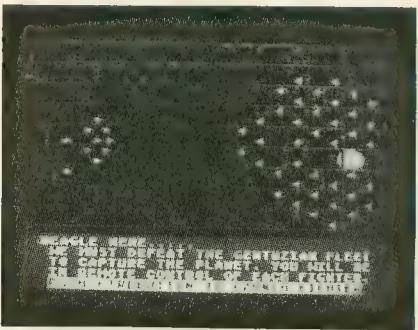
There's one relatively minor flaw. Upon loading the game, a 40-second-long introduction displays Bruce Lee's likeness accompanied by pleasant mood music. It's impossible to cut this short and get on with the game.

Bruce Lee is interesting, challenging, and fun to play. While it could stand an injection of excitement, it is a worthy addition to the adventure maze gamer's collection.

QUEST OF THE SPACE BEAGLE

Avalon Hill Game Company
4517 Harford Road
Baltimore, MD 21214
(301) 254-9200
\$35, 48K-disk-requires BASIC

Reviewed by Michael Ciraolo



Like its predecessor, **Jupiter Mission 1999**, **The Quest of the Space Beagle** combines a variety of arcade games under a uniting theme—your quest to survive, locate the earth and return home.

There are three parts. In the first, your ineffectual robot fighters battle a space armada as you attempt to capture a planet. Then you try to survive in a maze as your air and water repeatedly dwindle. Finally, your patience and memory skills are tested as you search for Earth among all the stars in the known universe. You can't get from one level to another without

product reviews

completing the first level, although you can save games.

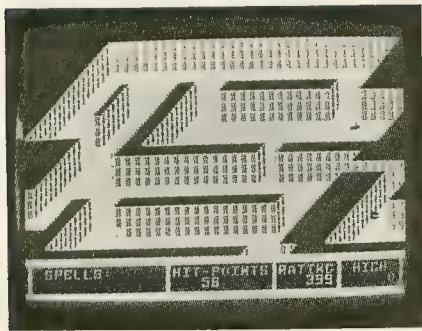
The graphics are fine, but are accompanied by a powerful 60-cycle flickering which is initially distracting and later headache producing.

The second major flaw: there is little incentive to get to the next level, so the game gets boring quickly. You do the same thing again and again. The only reward comes at the end of the game, when you find your way back to Earth. You'll need the attention span of Yoda to succeed.

REALM OF IMPOSSIBILITY

Electronic Arts
2755 Campus Drive
San Mateo, CA 94403
(415) 571-7171
\$35, 48K-disk.

Reviewed by Jack Powell



A few years ago, a guy named Mike Edwards started to write a football game. Somewhere along the line, the defensive team turned into zombies, spiders and snakes. The playfield twisted and mutated, and the whole thing became a nightmare. Mike called the game "**Zombies**" and a small software company named BRAM, Inc. put it on the market.

The original Zombies had seven dungeons and a total of 74 rooms, with some of the most stylish graphics seen on the Atari. Along came Electronic Arts, the software marketing marvels. They liked Zom-

bies a lot. So, they went to tiny BRAM, Inc. and **Realm of Impossibility** was born.

Realm of Impossibility is Zombies, but changes have been made. Some good. Some bad. The best part of Zombies had always been the incredible dungeon called "The Realm of Impossibility", which was fashioned after the intricate optical illusions of illustrator M.C. Escher. Electronic Arts sent Mike Edwards back to his computer to design more of these goodies. The result is six new dungeons and 55 additional rooms for a grand total of 129 rooms filled with snakes, spiders and zombies—plus some unusual beasties called "orbs", which bear a striking resemblance to Oreo cookies.

Some things haven't changed. You're still a tiny, frantic creature, jerking and waving in animated panic. The game has what is referred to as a "two player cooperative mode". This means that two of you can explore these mazes, but you must cooperate and help each other because both of you must leave each room together. If your partner dies, you can resurrect him.

In the old game, you searched each dungeon for one of the seven stolen crowns. In Realm of Impossibility, some of the rooms are locked and can't be entered until you find the keys hidden in the other rooms. This adds somewhat to the texture of the game play. There are also four levels of difficulty which I found to be a vast improvement over the original, which was so hard that I yanked the disk out of the drive and gave up in frustration.

Unlike most computer games, you have no weapons here. You can't kill anyone. Instead, you drop little crosses behind you which temporarily block the pursuers. You also collect spells which, when cast, confuse or freeze all opponents for a brief period. The method of casting a spell, however, is ridiculously awkward.

First, you've got to stop moving the joystick. When you've got every monster in the world racing after you, the last thing you want to do is stop. Fortunately, you can simply hit the space bar to cast a spell.

After a while it all becomes the same. It's still too frantic and speedy and little strategy or skill is required. The rooms are marvelous and inventive but they're really nothing more than decorative pathways filled with the same tiny relentless creatures.

RAILS WEST

Strategic Simulations, Inc.
883 Stierling Road, Building A-200
Mountain View, CA 94043
(415) 964-1353
\$39.95, 48K-disk

Reviewed by Christine Lunardini

From unexplored, unsettled wilderness to thriving, industrialized civilization in 60 years, this country changed as railroads laced the continent during the 19th century. It was a time of phenomenal growth where personal fortunes were made and lost as entrepreneurs competed to build industrial empires.

Rails West, (SSI), is one of the best economic simulations ever presented. Written by historian Martin Campion, Rails West reflects a substantial knowledge of 19th century railroad building. The game allows one to eight players to compete against each other or the computer to build a transcontinental railroad connecting midwest terminals to the west coast. You also compete to build the largest personal fortune.

Rails West is not for the faint of heart. It requires an understanding of free market economics and will challenge your skill as an entrepreneur. To succeed, you must figure out the relationship between issuing stock on the open market, floating bonds, and servicing your debts—while managing to

continued on next page

product reviews

keep enough of your corporation's stocks to prevent interlopers from gaining control of your road.

You can start the game in 1870, when there was only the skeleton of a rail network, or in 1890 when the roads were in place but ripe for takeover. The novice should gain experience playing the 1870 version first.

Rails West is both an educational simulation and a game of skill. Economic conditions fluctuate from year to year, and there is risk as you move from boom times through fair times to depression. The skill is in knowing when you can safely carry a large debt to capitalize your fledgling road, and when to play your cards closer to the vest with the intention of capitalizing on someone else's misfortune. You need not know about railroads or history to play Rails West, but there is a bonus for those who know something of the times.

Rails West is well worth the effort it takes to learn the rudiments of play. It will make an excellent classroom aid, particularly for group participation, and it is a challenging excursion into the land of robber barons for the individual player.

ADVENTURES WITH THE ATARI

by Jack Hardy
Reston Publishing
11480 Sunset Hills Rd.
Reston, VA 22090
(800) 336-0338
\$14.95

Reviewed by Jerry White

If you'd like to start creating your own adventure games, **Adventures With the Atari** is all you need.

This 356-page book includes type-in listings of six different adventure game programs. One text adventure and one graphic adventure are supplied in Atari BASIC, in Microsoft BASIC and in Atari PILOT. These well-

written programs are clearly printed for easy reading.

You also get two Atari BASIC programs—The Creator and The Interpreter—that let you design and write your own text adventures by simply filling in data. You can use the program shell to create as many different adventures as you like, as long as each game is stored on a separate disk.

The book also includes adventure maps and flowcharts, as well as a variety of useful programming information. And if you'd rather avoid hours of typing, the author will provide readers with the programs on disk for \$12.

My congratulations to Jack Hardy and Reston Publishing on a job well done.

X-BASIC & SCROLL-IT

SUPERware
2028 Kinghouse Road
Silver Springs, MD 20904
(301) 236-4459
\$29.95, disk or cassette
requires BASIC

*Reviewed by
Lawrence Dziegielewski*

There appears to be no end of strong new utilities for your Atari. SUPERware has taken some of the trouble out of BASIC programming with two utilities from programmer George Schwenk, X-BASIC and SCROLL-IT.

X-BASIC extends Atari BASIC by adding several powerful features at an extremely affordable price. The utility adds 30 functions, including string arrays, simplified Player/Missile graphics and sound and memory functions.

X-BASIC is loaded into about 2K of RAM. It is called into action from BASIC through the USR function. Each function is a separate, "pre-programmed" machine language subroutine which the user simply inserts into his own BASIC code. You just use

the X-BASIC mnemonic (such as DPEEK for a two-byte PEEK), which is easier to use than the standard convention of doing your own machine language subroutines. Sample programs are included on the disk which demonstrate the power of the utility.

The utility's one major drawback is that extensions must be loaded in every time you want to execute an X-BASIC coded program. One way to avoid this is to save the X-BASIC source with the BASIC source into one load file. But still, this is not as easy nor as convenient as a cartridge.

Schwenk's other utility is SCROLL-IT, a machine language program that allows the user to produce intricate fine screen scrolling without the hassle of extensive programming. A sample program is included with the program to demonstrate the utility's power.

SCROLL-IT is called from your BASIC program. It uses BASIC line

Sample programs
demonstrate
the power of the utility.

numbers 29000 to 29199, and is initialized with a USR call from within the program. Before calling in SCROLL-IT, the programmer must define certain variables in the USR call. Once defined, the USR call installs SCROLL-IT and executes it as a Vertical Blank Interrupt. If you have other routines that also execute during VBI, they must be defined and initialized before SCROLL-IT in order for the utility to work properly. Once the utility is in place, you need only POKE the various Page 6 locations to use SCROLL-IT's functions.

Both of these come with adequate documentation, but there is room for improvement. They are not as easy to

product reviews

use as a cartridge-based language, and assume too much skill of a beginning programmer. Once mastered, however, they make powerful tools.

MONTANA READING PROGRAM

PDI
95 East Putnam Avenue
Greenwich, CT 06830.
(203) 661-8799
\$24.95, 32K-disk
\$19.95, 32K-cassette

Reviewed by Rhonda Holmes

The Montana Reading Program helps improve a child's reading skills. Designed for children from five through eight, the program teaches 220 commonly used words that make up the Dolch list. Successful learning of these words is widely believed to strengthen reading ability.

**The concept of moving
up in levels
helped motivate the kids.**

Target words are displayed in simple sentences. After a sentence is displayed, the target word flashes for a short time and is then erased. A box is set in place of the word, outlining the word's basic shape and length. The child is asked to type in the missing word. If the first try is correct, 150 points are tallied on the pinball-style scoreboard. If the child makes a mistake, the computer gives the message to try again. If the child doesn't get it by the third try, the computer proceeds to the next sentence.

Twelve children, between four and eight, who helped me review this program found its graphics and sound captivating. The concept of moving

up in levels through continued play helped motivate the kids. Beyond its benefit to reading skills, this program also builds computer and typing skills . . . all increasingly important today.

ASSEMBLY LANGUAGE PROGRAMMING FOR ATARI

by Mark Chasin
McGraw-Hill Inc.
1221 Ave. of the Americas
New York, NY 10020
(212) 997-1221
\$15.95

Reviewed by Jerry White

Learning assembly language isn't supposed to be easy, but it just got easier to understand with **Assembly Language Programming for the Atari Computer**.

This readable 304-page book takes you from the fundamentals of AL programming to complex examples that fully utilize the Atari's unique architecture. It is the book to read if you want to learn AL or simply AL subroutines.

You'll learn about Atari hardware, assembler software and legally accessing Atari operating system routines. Routines included teach the use of interrupts, I/O, sound and graphics; the source code for these routines is available on disk for \$12.95.

CHAOS

Touch Stone Software
3213 South 214th East Avenue
Broken Arrow, OK 74014
(918) 258-0222
\$29.95, 48K-disk

Reviewed by Christopher Chabris

CHAOS, the Character Animation Operating System, produces complex animation by combining the concepts of character and Player/Missile graphics.

Like P/M graphics, CHAOS has

movable objects and collision registers. However, it also has eight shapes, each composed of four colors and eight-by-eight pixel resolution. Because you're able to use P/M and CHAOS together, you can have up to 16 moving objects on the screen simultaneously.

CHAOS is accomplished through BASIC's PEEK and POKE function. Objects can be moved automatically in four directions at two speeds. The system places an object's coordinates and collision information in registers that your program can read, so your program can activate the motion with a few POKEs and then rest while CHAOS executes the motion every VBI. This is an excellent feature because it frees your program for other processing.

CHAOS consumes nearly 6K of RAM. If you use DOS 2.0, CHAOS, P/M graphics and Atari BASIC, you could have only 23K RAM free. However, CHAOS uses none of the Page 6 memory and is compatible with BASIC XL.

A

New Atari Customer Service Phone **(408) 745-4851**

As Antic went to press, we discovered that the Atari Corp. once again has a Customer Service phone number. It's (408) 745-4851—no more toll-free 800 service. And unfortunately the line seems to be busy most of the time.

For the Atari Corp's current service policy, see the previous issue of **Antic** (December 1984, page 6).

BACK ISSUES & DISKS '83-'85

Limited numbers of Antic Magazine back issues still available. Hurry, order now and complete your Antic library! Still only: \$4 each USA, \$5 each Foreign.

For Atari
Compatibles
PC Compatible

**SUBSCRIBE
NOW!
RATES WILL BE
GOING UP!
EFFECTIVE 1/85**



	# Programs/K	Magazine	Disk
Mar. '83	Display Lists, Tiny Text		<input type="checkbox"/>
Apr. '83	Games, 3-D Maze,		<input type="checkbox"/>
May '83	Telecomputing, Microids		<input type="checkbox"/>
June '83	Databases, Stargazing		<input type="checkbox"/>
July '83	Adventure Games, USR	6/33K	<input type="checkbox"/>
Aug. '83	Graphics, Keystroke Artist	9/66K	<input type="checkbox"/>
Sept. '83	Education, P/M Tutor	8/35K	<input type="checkbox"/>
Oct. '83	Sports Games, AutoCassette	10/52K	<input type="checkbox"/>
Nov. '83	Sound & Music, Air Raid	9/51K	<input type="checkbox"/>
Dec. '83	New Product Guide, Robots	13/60K	<input type="checkbox"/>
Jan. '84	Printers, Screen Dump	12/54K	<input type="checkbox"/>
Feb. '84	Personal Finance, Gantlet	12/64K	<input type="checkbox"/>
Mar. '84	Worldwide Users, DiskRead	14/60K	<input type="checkbox"/>
Apr. '84	Risky Rescue, Math Wizard	15/59K	<input type="checkbox"/>
Ma/Ju '84	New XLS, Epsilon Escape	10/54K	<input type="checkbox"/>
July '84	Plato, Telecomputing	6/38K	<input type="checkbox"/>
Aug. '84	Disk Drives, Horsplay	6/67K	<input type="checkbox"/>
Oct. '84	4/5 Animator, Bouncing Ball	9/63K	<input type="checkbox"/>
Nov. '84	Adventure—3 Games	9/60K	<input type="checkbox"/>
Dec. '84	New Product Guide, Biffdrop	6/30K	<input type="checkbox"/>
Jan. '85	Super Utilities, DISKIO	7/62K	<input type="checkbox"/>
TOTAL DISKS			<input type="checkbox"/>
TOTAL MAGAZINES			<input type="checkbox"/>

Mail Today To:

Antic Publishing 594 Second Street San Francisco, CA 94107

Phone toll-free 24 hours daily for instant credit card orders:

(800) 227-1617, ext. 133. In California (800) 772-3545, ext. 133.

Allow 8 weeks for delivery.

160+ ANTIC Disk Programs!

Now ready-to-RUN . . . more than 160 great programs from Antic back issues on disk! Complete program disks for every Antic issue since July, 1983 (Vol. 2 No. 4). Average disk is at least 55K with over 9 programs. Each disk— Only \$12.95.

**SPECIAL
OFFER!
LIMITED TIME
ONLY!**

**BUY 3 DISKS
GET 1 FREE!
OR ANY 12 DISKS
FOR \$99.95!**

Free disk offer expires February, 1985.

Qty.	Item	Price	Shipping & Handling	Total
	Magazines USA	\$4 each	N/A	
	Magazines Foreign	\$5 each	N/A	
	Disks	\$12.95 each	+\$2 USA or \$3 Foreign	
3	Disks + 1 free	\$38.85	+\$2 USA or \$3 Foreign	
12	Disks (Save \$55)	\$99.95	+\$2 USA or \$3 Foreign	
			CA res. add 6 1/2% sales tax	
				GRAND TOTAL

Name _____ please print
Address _____

City/State/ZIP _____

*Outside U.S.A.: must send U.S. funds by check or draft on U.S. bank.

Total Order \$ _____ Check Or Money Order Enclosed
Charge to My: Visa MasterCard

Account # _____ Expiration Date _____

CARDHOLDER: Name _____ please print

Signature _____

NEW!

PRINTER ACCESSORIES FROM

DIGITAL DEVICES 

U•PRINT 

PARALLEL PRINTER INTERFACE

Expand your Atari® or Commodore® computer with Digital Devices **U•PRINT**. We make it simple to add any printer you choose. **U•PRINT** interfaces feature industry standard Centronics parallel connectors to hook up an Epson, Star, NEC, C.Itoh, Okidata, or any other printer.

U•PRINT MODEL A

- EXTRA SERIAL PORT FOR DAISY CHAINING OTHER PERIPHERALS.
- COMPATIBLE WITH ALL ATARI HARDWARE AND SOFTWARE.

U•PRINT MODEL C

- EMULATION OF COMMODORE PRINTERS, INCLUDING GRAPHICS.
- COMPATIBLE WITH ALL COMMODORE HARDWARE AND SOFTWARE.

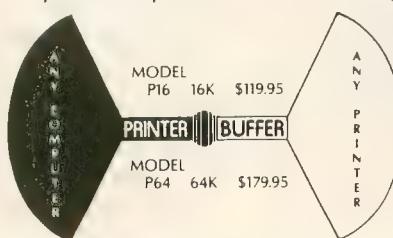


Compact, easy to install, and costing only \$89.95, **U•PRINT** gives you a choice!

PRINTER BUFFER 

CENTRONICS PARALLEL INTERFACE

The **PRINTER BUFFER** is the low-cost way to make your computer even faster! The **PRINTER BUFFER** takes information from your computer at high speed, stores it in memory and then retransmits it at the slower speeds a printer requires. Your computer is quickly free from the task of printing so you can do other things without waiting. With **PRINTER BUFFER** you can print and process simultaneously.



call TOLL FREE (800) 554-4898 for more information
on these peripherals from 

DIGITAL DEVICES 

430 Tenth Street, Suite N205 Atlanta, Georgia 30318
In Georgia (404) 872-4430;

* ATARI AND COMMODORE ARE REGISTERED TRADEMARKS OF
ATARI, INC. AND COMMODORE ELECTRONICS LTD. RESPECTIVELY.

PARTS/SERVICE FOR ATARI COMPUTERS

ORIGINAL FACTORY PARTS FOR 800/400, 810, 820, 850,

UPGRADE TO GTIA, 48K AND

REV. "B" OPERATING SYSTEM

CUSTOM 810 DISK DRIVES ... \$245.00

INTEGRATED CIRCUITS FOR 800/400

GTIA Chip ...

upgrade with instructions ... \$11.50

10K rev. "B" O.S. Upgrade ...

3 chip rom set with instructions ... \$12.50

Pokey Chip ... C012294 ... \$8.50

Antic Chip ... C012294 ... \$10.00

PIA Chip ... C014795 ... \$11.00

MODULES/CIRCUIT BOARDS

...complete with IC's
16K Ram Memory Module ...

CX853 ... \$24.50

800 10K Rev. "B" O.S. Module ... \$18.50

800/400 CPU Board with GTIA ... \$24.50

800 Main Board ... \$28.50

400 Main Board ... \$26.50

400 Main Board W/O IC'S ... \$8.50

800 Power Supply Board ... \$10.50

810 Data Separator Board ...

upgrade with instructions ... \$25.00

810 Side Board W/O Sep. & I771 ... \$43.50

810 Rear Power Board ... \$25.00

810 Analog Board ... \$16.00

AMERICAN TV

Mail Order Address ... 15338 Inverness St., San Leandro, CA 94579.

Retail Store ... 1988 Washington Ave., San Leandro, CA 94577.

Terms: We accept money orders, personal checks or COD. VISA/Mastercard OK on orders over \$25.00. No personal checks on COD.

Shipping: \$4.00 Shipping and handling on orders under \$150.00. Add \$2.00 for COD orders. CA res. include 6 1/2% sales tax. Overseas shipping extra.

Prices subject to change without notice. We reserve the right to limit quantities. Sales limited to stock on hand. AK, HI, FPO/APO, add \$5.00 on all orders.

Much More! Send SASE for free price list.

Repair and upgrade services available ... Call. *Atari is a registered trademark of Atar, Inc.

MISC.

810 Rear Board/Analog Board Upgrade ...

with 10 pin jumper and instructions ... \$39.50

Editor Assembler ... \$29.95

Basic Cartridge W/O Case. Manual ... \$23.50

Cartridge Circuit Boards ... \$4.00

Non-Atari Cartridge Boards ... \$2.00

800/400 Repair Manual ... \$39.95

Non-Atari power transformer ... \$16.50

PHONE 415-352-3787

TURN US ON...line
CVC Online, number 1 in erotic telecoms.



We're
proud to
announce
the first
UNCENSORED
videotex and
computer
communications
service

For a **FREE** brochure
call (212) 582-2006
or write to **CVC Online**
801 Second Ave, N.Y., N.Y. 10017



SHOPPER'S GUIDE

FREE SHIPPING	
INDUS GT	\$315
ASTRA 2001 - (2 drives in one a must for the serious user)	\$519
810 Disk Drive - (New - Surplus our case)	\$289
RM 1000 (with disk software and cable) exciting send/receive Morse - RTTY radio modem	\$ Write
SOFTWARE SPECIALS	
Visicalc - super buy	\$79
Letter Perfect	\$69
Data Perfect	\$69
Pro Business Pkg. all 3	\$199
STEWART ELECTRONICS	
P.O. Box 155 Mullin, TX 76864	
Tx. add 5-1/8%	

NEW FOR ATARI 400/800/XL	
PASSWORD ADVENTURE	
Explore a magic forest, visit dark caverns, collect valuables, deal with shady characters, enter houses and shacks, open locked chests, dig for clues... and solve a new mystery in a different forest each game! Random generation. All text.	\$19.95

RETRIEVER DATA BASE	
Featuring user-customized records, fast sort in all fields, key-word and list searches, screen and printer outputs with field selection, and easy Add/Amend/Delete functions. Ideal for stamp or book collections, address lists, etc. Adapts to RAM size on board.	\$19.95

Both programs available in 32K disk and 16K cassette version
(Specify) Cheque VISA, MC Dealer discounts available

INTER-8
502-285 Loretta Ave. South
Ottawa, Ontario K1S 5A5, Canada

INDUS GT \$289.95

THE BEST DISK DRIVE - THE BEST PRICE

ATARI® 800XL Computer	\$189.95
ATARI® 600XL Computer	\$119.95
APE FACE Printer Interface	\$59.95
ATARI® 1050 Disk Drive	\$248.00
ATARI® 1030 Modem	\$69.95
ATARI® 850 Interface	\$110.00
BASF SS/DD Disks - Box/10	\$17.95
ASTRA 2001 Dual Disk Dr. w/DOS	\$525.00
ATARIWRITER® Word Processing Kit	\$69.95
SYNTREND, SYNFILE + or SYNCALC	\$58.00

Shipping charges add \$2-\$5 per order
FREE catalogue of Atari, software and accessories

ABP, Ltd.
Box 109   or C.O.D.
Mechanicville, NY 12118

(518) 664-4966

NOW!
UPDATE
YOUR ATARI®
KEYBOARD WITH
GRAPH-FIX
KEYBOARD
LABELS

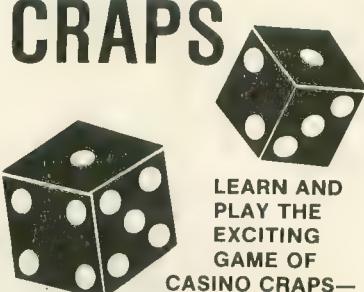
- Convenient
- Saves Time
- Fits All Models
- Improves Accuracy
- 29 Easy-to-Apply Symbols to Label Each Graphics Key

Mylar-Coated for Long Durability
In Stock Now - Shipped Within 24 Hours
100% Money Back Guarantee!

TO ORDER send \$5.95 check or money order
(Texas residents add 5-1/8% sales tax) to:
DOVESTAR CREATIVE CONCEPTS
P. O. Box 2109, Dept. 1015, Nederland, Texas 77627
(409) 727-5978 (No collect calls, please)
MASTERCARD and VISA customers call Toll-Free
1-800-531-7383 (In Texas 1-800-292-5098)
Ask Operator for EXPRESS NUMBER 1037
DEALER INQUIRIES RECOMMENDED!

GIVE YOUR COMPUTER A SET TODAY!

CRAPS



LEARN AND
PLAY THE
EXCITING
GAME OF
CASINO CRAPS—
THE INEXPENSIVE WAY

◆ FANTASTIC GRAPHICS
◆ JOYSTICK CONTROL
◆ ONE KEYSTROKE GAME INSTRUCTIONS
◆ REAL CASINO LIKE PLAY
(ATARI 48K DISK —\$24.95 EACH)

SEND CHECK OR MONEY ORDER TO:
STICK AROUND SOFTWARE
123 CIMARRON STREET
RICHLAND, WASH. 99352
(509) 627-4914

REALLY USE YOUR ATARI!

Q: What's the unpleasant monthly task
that could easily be computerized?
A: Balancing the bank statement!

Get CHECKBOOK CHECKER---

- *So simple to use, it overcomes spouse's computerphobia.
- *Fewer steps than usual—
- Let the computer do the work!
- *Fully prompted by TV screen.
- *Specialized for home checkbooks.
- *Unusual features such as independent adder, to find errors.
- *Ideal birthday or holiday gift: Useful—and what a price!

Atari, 32K min., Printer optional.
Disk \$9.95 Postpaid
(NJ residents add 6% tax.)

PRINCETON COMPU-CENTER ASSOCIATES
119 Jefferson Rd.
Princeton, NJ 08540

DISK BREAKS?

Fast, Reliable Repair
for Atari 810 & 1050
Disk Drives

- 3 Day Turnaround
- 90 Day Warranty
- \$85 Flat Rate with Repairable Exchange

Dealers—Special Rates Available
Ask about Express Expedite

MPS

The Disk Drive Specialists
(916) 786-6550

Add \$10 shipping & handling.
Check, MO, Visa, MC

Attention Atari 810 owners

THE "CHIP"

with Archiver/Editor Software 810
Automatic Disk Backup
\$99.95 Post Paid
Available soon for 1050 and
Percom Drives

HAPPY 810 ENHANCEMENT

\$199.95 Post Paid
Includes Warp Drive Package

ARCHIVER/EDITOR "HAPPY VERSION"

Runs on Disk Drives with Happy 810
Enhancement; makes Happy Drives compatible with The "Chip"
\$39.95 Post Paid

Call or write for free brochure

Southern Software A division of Southern Supply Co.

1879 Ruffner Road,
Birmingham, Alabama 35210
Phone 205-956-0986

Prices subject to change without notice.

NEW

dragonquest 3.14
the GRAPHIC ADVENTURE

ATARI 32k Disk

satisfaction guaranteed

CALL OR WRITE TO ORDER

midwest computing
4975 brookdale rd.
bloomfield hills, mi.
(313) - 645-2140 48013

COMPUTAC

Catalog of Computers and Supplies

Our Prices are WHOLESALE +10%
Samples!!!

ATARI 850 INTERFACE — \$220
Compucat — \$166

INDUS GT DISK DRIVE — \$449
Compucat — \$285

RANA 1000 DISK DRIVE — \$449
Compucat — \$305

We support the complete ATARI and COMMODORE product lines. Ask for our free price list

(408) 353-1836

FREE SOFTWARE with any order over \$100.00.

Instant shipping (as fast as we can). Mastercard & Visa accepted (no extra charge). Shipping & handling add 6%. California customers add 6.5% sales tax. Order by phone (Mon. - Fri. 10 am - 5 pm PST). Order by modem (daily 6 pm-9am) from our online TeleCatalog. Prices subject to change without notice.

COMPUTAC
24500 Glenwood Hwy., Los Gatos, CA 95030

INDUS **\$299**

The incredible Indus GT Disk Drive.

INCLUDES:
Database Manager, Spreadsheet, Word Processor, DOS, DOS XL,
Carrying Case and One year warranty.

GEMINI 10X

APEFACE Printer Interface
with daisy chain port---\$65.00
without daisy chain port---\$59.00
ATARI 850 Printer Cable---\$24.00

\$267.00

PRINTER RIBBONS

EPSON M170/80 Cartridges-COLORS
Black/Red/Blue/Brown/Purple
each-\$5.50 dozen-\$40.00

KODAK PAD with Software---\$77.00
Programmer's Guide & Disk---\$14.00

OKIDATA 80,82A,83A,90,92
GEMINI 101/151
Black or Blue each-\$3.00 dozen-\$28.00

VERBATIM DATALIFE-SS/HD---\$21.00
ATARI GTIA Chip -----\$16.00
FLOATING POINT Fast Chip ---\$24.00

D B M Enterprises FREE SHIPPING
315 North Utica Avenue UPS GROUND
N. Massapequa, NY 11758

516-293-5698

THE LISTED PRICES REFLECT A \$1 CASH DISCOUNT ADD \$1 TO ORDER IF USING
CHARGE CARD. ADD \$3.00 ADDITIONAL FOR COD. NY RESIDENTS ADD LOCAL SALES
TAX. PRICES/AVAILABILITY SUBJECT TO CHANGE WITHOUT NOTICE.
PERSONAL CHECKS REQUIRE 2 WEEKS TO CLEAR.

Stock Market Timing Tools
for
Atari 800 with 48K Disk Drive

indicates
Performance Comparisons
Uptrends and Downtrends
2 variable moving averages
Overbought and Oversold Readings

AND MORE
Not a Game under \$30.00
for free info. write to:

M.A.R.K. Enterprises
P.O. BOX 83007
LOS ANGELES, CA 90083

**YOUR AD
COULD
APPEAR
HERE
CALL
415/661-3400**

New Low Price - Complete!

INDUS GT
\$299.95

MPP MICROPRINT INTERFACE	\$49.95
MPP 1150 PRINTER INTERFACE	\$69.95
MPP 1100 MODEM	\$129.95
SYNCALC, SYNFILE, or SYNTRENDS	\$49.95
CUTTHROATS (Infocom)	\$24.95
HITCHHIKERS (Infocom)	\$24.95
SUSPECT (Infocom)	\$24.95
IMPERIUM GALACTUM (SSI)	\$29.95
FIELD OF FIRE (SSI)	\$29.95
ULTIMA III	\$34.95
UNIVERSE	\$59.95

Please add \$2.50 shipping (\$4.50 outside USA)
California residents add 6%.

COMPUTER GAMES +
BOX 6144
ORANGE CA 92667
(714) 639-8189

CALLING ALL USER GROUP OFFICERS!

Find out how your users group can get a **FREE** listing in Antic Magazine.

Write or Phone Today!

Antic Worldwide Users Network

524 Second Street — San Francisco, CA 94107

(415) 957-0886



FROM

SENECOM



THREE PDQ DISKS AND A NEW FUTURE **\$9.95**

There is untapped potential in your Atari. And, perhaps, in you...

We'd like to share an opportunity too unique and worthwhile to describe in an ad. We're offering this remarkable bargain so you can see it for yourself without risk.

Order three PDQ (Premium Disk Quality) Disks (DSDD, 21-year Warranty) for only \$9.95. The front of each disk is ready for you to format and use. Boot in the program on the back (min. system: 48-K), and you may be surprised at what your Atari tells you.

Order PDQ! Write "PDQ" on a paper, with your (legible!) name and address; send with \$9.95 (We'll pay the shipping for USA and Canada. NYS residents add 7% Sales Tax) to:

SENECOM

Dept. 11

13 White St.

Seneca Falls, N.Y. 13148

Limit: one order per address, please.

Atari® is a registered trademark of Atari Corporation.

Senecom® is a registered trademark of Seneca Computer Company, Inc.

ATARI ENHANCEMENTS

• RAMROD	\$127.95	• RAMROD XL	\$97.95
• ATR 8000	\$ CALL \$	• THE IMPOSSIBLE	\$129.95
• R-VERTER INTERFACE	\$39.95	• XL FIX	\$42.95
• BIT 3 BOARD	\$229.95	• COMPUSERVE STARTER	\$29.95
• HAPPY ENHANCEMENT	\$189.95	• THE PILL	\$59.95
• PLASTIC LIBRARY DISK CASE	\$17.95	• HAPPY 1050 MAXIMIZER	\$97.95
• 128K RAMDISK	\$259.95	• HAPPY 1050 CONTROLLER	\$39.95
• GOLD MONITOR CABLE	\$8.95	• OMNIMON	\$79.95
• FAST CHIP	\$24.95	• MPP 1000C MODEM	\$127.95
• OMNIVIEW	\$27.95	• PLASTIC 75 DISK FLIP SORT STORAGE CASE	\$17.95
• CO-POWER 88	\$449.95	• 300/1200 BAUD INTELLIGENT MODEM	\$199.95
• 52K BOARD	\$97.95	(5) SS/DD DISKS IN PLASTIC LIBRARY CASE	\$19.95
• 64K for 600 XL	\$109.95		

PARALLEL PRINTER INTERFACE WITH PRINTER \$49.95



5 1/4"
FLOPPY
DISKS

• BULK SS/DD	1.19 ea
DS/DD	\$1.69 ea
• LIFELONG SS/DD	\$16.95
DS/DD	\$21.95
• VERBATIM DATALIFE SS/DD	\$17.95
DD/DD	\$23.95
• ELEPHANT SS/DD	\$16.95
SS/DD	\$17.95
DS/DD	\$22.95

PRINTERS

- ATARI 1020
- ATARI 1025
- ATARI 1027
- C. ITOH
- PANASONIC 1091
- PANASONIC 1090
- OKIDATA-ML80

CALL
FOR
PRICING

DISK DRIVES

- HAPPY ENHANCED 1050
- ASTRA 2000
- TRAK ATD2
- INDUS GT
- PERCOM AT88
- ATARI 1050

CALL
FOR
PRICING

CALL FOR FREE ATARI SOFTWARE CATALOG

BITS & BYTES OF ELECTRONICS

TO ORDER CALL 1-800-241-5119

In Georgia Call (404) 442-1516

Atari is a registered trademark of Atari, Inc.

ELECTRONIC-ONE*

ATARI COMPUTER HARDWARE

ATARI 800XL.....165.00

410 CASS. RECORDER.....34.99

1010 CASS. RECORDER.....49.99

DISK DRIVES

ATARI 1050.....209.99

RANA 1000.....269.99

TRAK ATD2.....329.99

INDUS G.T.....269.99

PRINTERS

GEMINI 10X.....239.99

GEMINI 15X.....339.99

STAR POWERTYPE.....319.99

EPSON RX80.....269.99

EPSON RX80 FT.....289.99

NEC 8027 (NEW).....339.99

PROWRITER.....339.99

INTERFACE CABLE APE FACE.....52.99

MPPI150.....62.99

ATARI COMPUTER HARDWARE

1027 LETTER QUALITY PRINTER.....239.99

1025 DOT MATRIX PRINTER.....179.99

1030 MODEM.....54.99

CX77 TOUCH TABLET.....39.99

CX75 LIGHT PEN.....34.99

MPP 1000C MODEM.....109.99

AMDEC COLOR-ONE

PLUS MONITOR.....229.99

COMMODORE 1702 MONITOR.....239.99

SAKATA 14" COLOR.....209.00

SPECIAL

ATARI 1020

COLOR

PRINTER

PLOTTER

59.99

THE LOWEST PRICES
ATARI PRICES
ARE THE
BEST
SERVICE

ELECTRONIC CALL
ONE (614)864-9994
P.O. Box 13428 • Columbus, Ohio 43213

THE LOWEST PRICES
ATARI ATARI COLECOVISION
2600 5200 INTELLIVISION
GAMES GAMES ATARI SOFT.

ATARI COMPUTER SOFTWARE

ATARI WRITER.....29.99

TOUCH TYPING.....9.99

LOGO.....59.99

CONV. FRENCH.....19.99

SYN FILE.....44.99

SYN CALC.....44.99

EASTER FRONT.....9.99

CENTIPEDE.....9.99

ATARI MACRO ASSEMBLER.....17.99

ASSEMBLE EDITOR.....24.99

FLIGHT SIMULATOR II.....34.99

SUMMER GAMES.....24.99

CALL OR WRITE FOR THE
PRICE OF YOUR PROGRAM.

HOW TO ORDER: CASHIER CHECK, MONEY ORDER, MASTERCARD® or
VISA® (Add 4% for charge cards) . . . NO C.O.D.'s . . . SHIPPED U.P.S.
SHIPPING: One day shipping. Ohio residents add 5.5% sales tax. Add \$3.00
on all orders under \$100.00 . . . Add \$5.00 on all orders over \$100.00.
INTERNATIONAL: Add 15% to all orders.

CALL OR WRITE FOR FREE CATALOG

ELECTRONIC ONE* (614)864-9994
P.O. Box 13428 • Columbus, Ohio 43213

Happy New Year!

HARDWARE!

	RETAIL	NET
OMNIMON.....	\$ 99.95	CALL
HAPPY DRIVE 800.....	\$199.95	CALL
HAPPY DRIVE 1050....	\$249.95	CALL

SOFTWARE!

F-15 EAGLE STRIKE...	\$ 34.95	\$ 25.50
UNIVERSE.....	\$ 99.95	\$ 59.95
FLIGHT SIMULATOR....	\$ 49.95	\$ 37.50

ALL THIS AND SO MUCH MORE AT THE:
C.E.S.*

CALL:

1-800-223-2686

IN CA CALL:

1-714-635-8621

"WHERE IS IT?"

CALL:

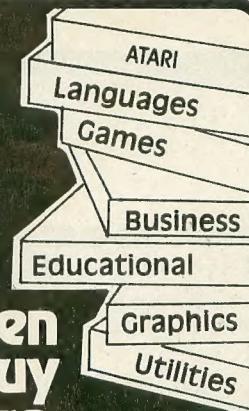
1-714-635-8622

CES ACCEPTS ALL FORMS OF PAYMENT (CARDS ADD 4%). ALL SHIPPING CHARGES C.O.D. WE ALSO CARRY AUDIO, AND VIDEO EQUIPMENT. ALL PRICES ARE AT OUR COST + 10% OR LESS!! YEAH!! *Consumer Electronic Store. HAPPY NEW YEAR!!!

ADVERTISERS

ABBY'S HOUSE OF DISCOUNT SOFTWARE	28
ABP	86
ADD-ON	49
ALLEN MACROWARE	50
AMERICAN TV	85
ANTIC, INC.	32,68,84
ASTRA SYSTEMS	26,27
AXLON	18
BATTERIES INCLUDED	2,7
BITS & BYTES	88
BLAKMAGIC SOFTWARE	78
COMPUTACAT	87
COMPUCLUB	89
COMPUTER CREATIONS	39
COMPUTER GAMES+	86
COMPUTER PALACE	71
COMPUTER SOFTWARE SERVICE	73
CONSUMER ELECTRONICS	88
CVC ONLINE	85
DBM ENTERPRISES	87
DIGITAL DEVICES	85
DOVESTAR CREATIVE CONCEPTS	86
EASTERN HOUSE	42
EPYX	15
HAPPY COMPUTING	43
INDUS	24
INTER-8	86
JOHN DIANA ASSOCIATES	67
LOTSA BYTES	9
M.A.R.K. ENTERPRISES	87
MAXIMUS	14
MICROBITS PERIPHERALS	BC
MICROPROSE SOFTWARE	91
MIDWEST COMPUTING	87
MMG	4
MPS	86
OSS	22
ORIGIN SYSTEMS	16
PCA	86
PROGRAMMER'S WORKSHOP	38
ROYAL SOFTWARE	23
SEMI-SOFT	78
SENECOM	88
SOFTWARE DISOUNTERS OF AMERICA	78
SOUTHERN SOFTWARE	86
SSI	13
STEWART ELECTRONICS	86
SUBLOGIC, INC.	29
SWP	3
VIDEO GAMES EXPRESS	88

**BE A
PREFERRED
CUSTOMER!**



**when
you buy
Atari® software.**

- **PREFERRED CUSTOMERS...** have over 2,000 software items to choose from.
- **PREFERRED CUSTOMERS...** get at least 25% off all titles (and often more!).
- **PREFERRED CUSTOMERS...** buy from people who specialize in ATARI® exclusively.
- **PREFERRED CUSTOMERS...** receive prompt, knowledgeable service.
- **PREFERRED CUSTOMERS...** receive 8 pg. newspapers 9 times a year filled with critiques, special tips, and classified ads for new and used equipment.
- **PREFERRED CUSTOMERS...** receive our 80 pg. catalog and 20 pg. pricebook.
- **PREFERRED CUSTOMERS...** receive consistent low prices and good knowledgeable service.
- **PREFERRED CUSTOMERS...**

JOIN CompuClub™

Where Atari owners belong.

To join by phone
call toll free

800-631-3111

In Mass. call 617-879-5232

Please have credit card number ready!

Or return this coupon with \$5.00*

YES, I want to be a preferred customer of CompuClub™. Rush me my catalog and price book. Enclosed please find my \$5.00 registration fee.

Please make check payable to Compuclub™

Payment enclosed check money order

**Bill my Mastercard Visa Expires _____
ID# _____**

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Computer Model _____ Disk Tape

Hours: Mon. - Fri. 11:00 AM - 7:00 PM Eastern time

Answering services after hours

CompuClub™, P.O. Box 652, Natick MA 01760

*Overseas membership \$15.00 per year

Atari - Trademark of Warner Communications Co.

new products

INSIDE THE PERSONAL COMPUTER

(pop-up book)

Abbeville Press, Inc.
505 Park Ave.
New York, NY 10022
(212) 888-1969
\$19.95

How do you teach small children—and adults—about computers? The latest passport to computer literacy is an adorable pop-up book that describes and illustrates the workings of a microprocessor, video tube, disk drives and more. Pop-up construction lets you move parts and look inside models. It's a great way to learn, and may intrigue adults more than kids.



TAC-3

(joystick)

Suncom
260 Holbrook Drive
Wheeling, IL 60090
(312) 459-8000
\$14.95

Suncom's latest Totally Accurate Controller features three fire buttons, two on the base and a third on top of the grip-contoured handle. It is solid, responsive and backed by a two year guarantee. The Antic staff members who used the TAC-3 were pleased with its performance and excellent construction.

New Products notices are compiled by the **Antic** staff from information provided by the products' manufacturers. Antic welcomes such submissions, but assumes no responsibility for the accuracy of these notices or the performance of the products listed.

QUEST OF THE SPACE BEAGLE

(game)

Avalon Hill
4517 Harford Road
Baltimore, MD 21214
(301) 254-9200
\$35

48K—disk

This is the sequel to **Jupiter Mission 1999**. Like its predecessor, this two-disk game is actually several arcade games held together by a common story line. In the **Space Beagle**, you're lost in a strange galaxy. As you try to get back home, you battle fighter ships, travel the Labyrinths of Kamerra, and eventually explore the entire known universe with allegedly authentic star maps as you search for the Earth.

POPCOM X100

(modem)

Prentice Corp.
266 Caspian Dr.
P.O. Box 3544
Sunnyvale, CA 94088
(408) 734-9810
\$475

One of the hottest new modems, the **Popcom** is an autodial/autoanswer, 300/1200 baud modem with audio monitor and voice-over-data, a feature that allows you to pick up the phone and talk to the person at the other end while your computers are on-line. It is simple to use and automatically adjusts to cabling pinout arrangements and telephone line status—simply plug it in and it's ready. Alas, it doesn't have any status lights.

PITFALL II: LOST CAVERNS

(game)

Activision, Inc.
2350 Bayshore Frontage Road
Mountain View, CA 94043
(415) 960-0410
\$32.95
18K—cartridge

Follow Pitfall Harry as he seeks the Raj diamond in the Caverns of the Incas, in this sequel to the best-selling arcade game **Pitfall**.

INVESTOR'S EXPRESS

(on-line brokerage)

Fidelity Investments
82 Devonshire Street
Boston, MA 02109
(617) 292-7040

\$49.95 registration fee, \$15/month and 40 cents/minute during peak (7:00 a.m. to 6:00 p.m. weekdays), 10 cents/minute during nonpeak hours.

This service allows you to trade stocks and options, analyze your portfolio and obtain stock quotes with your Atari. You can also display projected dividend yields, review a schedule of capital gains and losses, and follow IRA and Keogh portfolios.



AT605 AUDIO INSULATORS

Audio-Technica

1221 Commerce Dr.
Stow, OH 44224
(216) 686-2600
\$27.95

Found in high-end audio stores, these feet are perfect for reducing the "shake, rattle and roll" caused by printers. The suggested retail price includes four round energy absorbers, each encased in a brushed chrome housing.

Return the favor. When you call a manufacturer or supplier about a product you've seen advertised or otherwise mentioned in ANTIC, please tell them so. This will help us to continue to bring you the latest information about products that will make your Atari computer an even more valuable investment in the future. —ANTIC ED

F-15 STRIKE EAGLE



Put a \$20,000,000 Thrill in your Computer!!!

The F-15 STRIKE EAGLE, one of the world's most sophisticated fighters, costs the Air Force more than \$20,000,000.00 each. Now you too can strap into your ejection seat and prove how good you really are in exciting modern jet fighter combat. Fly combat missions, engage enemy aircraft, and destroy enemy ground targets from historic missions over Southeast Asia to today's defense of the strategic oil routes through the Straits of Hormuz.

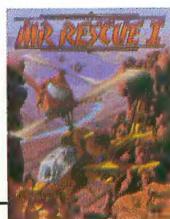
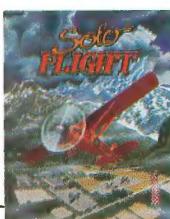
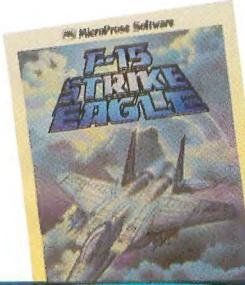
F-15 STRIKE EAGLE (simulator) has all the features that makes the real EAGLE the great fighter aircraft it is — afterburners, multiple radars, air to air missiles, high explosive bombs, cannon, drop tanks, Electronic Counter Measures (ECM) flares, electronic ground tracking maps, Heads Up Display (HUD), outstanding 3-dimensional cockpit visibility, and realistic F-15 maneuverability. Your mission is to take off from your base, fly to and destroy your primary target through all the dangers of enemy territory including Surface to Air Missiles and enemy aircraft. Of course, you have to get back home again, too!!

F-15 STRIKE EAGLE is a very real simulation, accom-

plished with the guidance of real fighter pilots, and includes seven different combat missions, four skill levels, and an infinite number of exciting scenarios. F-15 will thrill and challenge you and give you the chance to prove you have the "Right Stuff" of an EAGLE fighter pilot!!

F-15 STRIKE EAGLE is available for Commodore 64, ATARI (48K), and Apple II (64K) computers. Suggested retail price is only \$34.95. Find STRIKE EAGLE at your local retailer, or call or write for MC/VISA, or COD orders. Add \$2.50 for Postage and Handling (Int'l add \$4.00USD). MD residents add 5% sales tax.

Experience the reality of these other great simulations from MicroProse



As close to the Real Thrill of Flying as You Can Handle!!!

Heart Pounding Accelerated Real-Time Defense of Europe Against Soviet Invasion!!!

Sensational Assault Chopper Rescue Raids for Daring Pilots!!!

MicroProse Software
The Action is Simulated — the Excitement is REAL!!

10616 Beaver Dam Road
Hunt Valley, MD 21030
(301) 667-1151

Expand
Your Atari

MicroPrint

Parallel Printer Interface



- Works with Atari 400, 800, 600XL, and 800XL
- Replaces Atari 850 Interface Module
- Compatible with all software

■ 5-foot cable with Centronics plug (compatible with Epson, NEC, Prowriter, etc.)

- Connects to serial bus on computer
- 2 year warranty

mpp
**MICROBITS
PERIPHERAL
PRODUCTS**

225 Third Avenue, SW
Albany, OR 97321
(503) 967-9075